

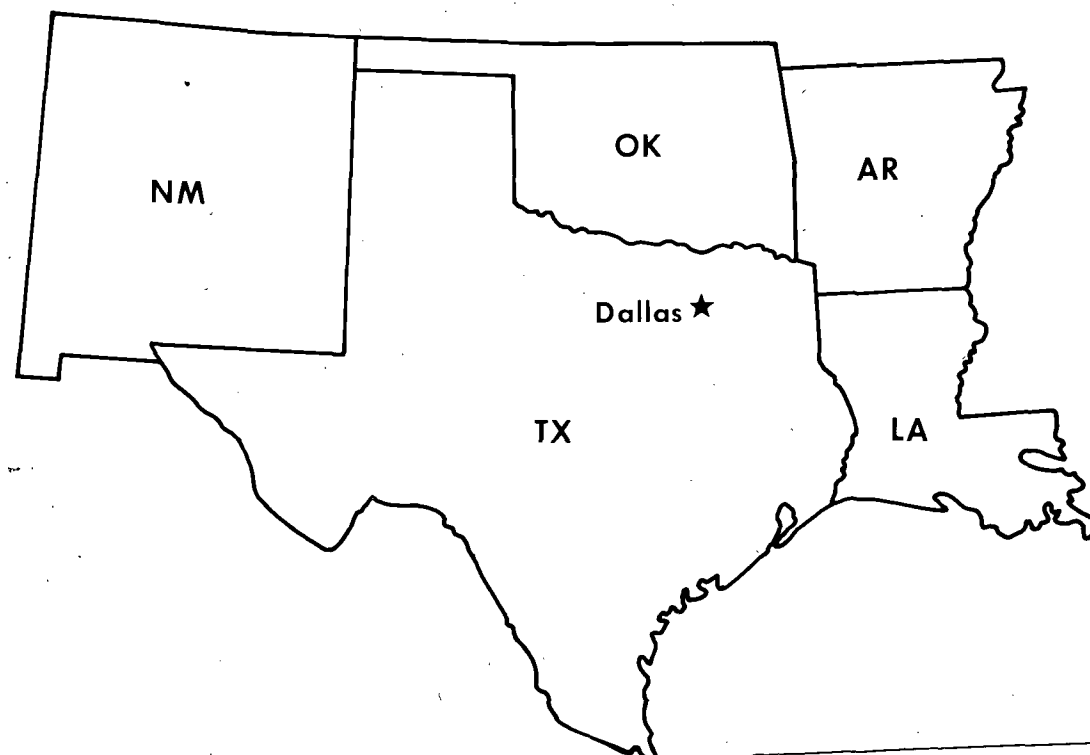
Research and Development



AERIAL PHOTOGRAPHIC ANALYSIS OF SELECTED HAZARDOUS WASTE STUDY SITES

New Mexico and Texas

EPA Region VI



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SELECTED HAZARDOUS WASTE STUDY SITES

New Mexico and Texas

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ABSTRACT

Intensive and single date analyses of aerial photographs that cover six selected hazardous waste sites in New Mexico and Texas were conducted by the U.S. Environmental Protection Agency. All analyses were performed by the Environmental Monitoring Systems Laboratory, Las Vegas, in support of the Agency's Region VI Environmental Services Division and Office of Emergency and Remedial Response in Washington, D.C. The analyses were performed to assist Region VI in monitoring and assessing site status.

Evidence of waste disposal was noted at all sites with the exception of the Moore Drum Site. Neither the Triangle Chemical or United Creosote facilities were active as of the fall 1982. A cleanup effort has been completed within the Triangle Chemical facility.

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INTRODUCTION

Aerial photographs were used to conduct intensive and single date analyses of selected hazardous waste sites within New Mexico, Texas, Arkansas, and Louisiana. The analyses were performed by the Environmental Protection Agency's (EPA) Environmental Monitoring Systems Laboratory, Las Vegas, at the request of the EPA's Region VI Environmental Services Division and Office of Emergency and Remedial Response in Washington, D.C.

This report, the first of two, contains the analyses of hazardous waste study sites located at Albuquerque, New Mexico; and Hutchins, Maynard, Conroe, Magnolia, Bridge City, Barrett, Crosby, and Houston, Texas (Figures 1, 11, 17, 36, and 43). A second report will cover the analyses of selected hazardous waste sites in Arkansas and Louisiana. All analyses presented in the two reports are conducted in order to assist Region VI in monitoring hazardous waste study sites in that Region and to provide photographic support to be used in site assessment.

METHODOLOGY

Stereoscopic pairs of historical and current aerial photographs are used to perform the analyses. Stereo viewing enhances the interpretation effort because it allows the analyst to observe the vertical as well as the horizontal spatial relationships of natural and cultural features. Stereoscopy is also an aid in distinguishing between the various shapes, tones, textures, and colors that can be found within a study area.

Evidence of waste burial and dumping is a prime consideration when conducting a hazardous waste analysis. Burial and dumping of hazardous materials could result in leachate or seepage which often threaten existing surface and groundwater sources. Pools of unexplained liquid are routinely noted because they can be indicative of seepage from buried wastes and may enter drainages that allow them to move offsite. The presence or absence of spills, spill stains, and vegetation damage within a site are excellent indicators of how well hazardous materials are being handled at that site. Trees and other forms of vegetation that exhibit a marked color difference from surrounding species of the same type are labeled "dead" or "stressed" based upon the degree of noticeable variation. Vegetation is so labeled only after a careful consideration of the season in which the aerial photographs were acquired.

Drainage analysis is conducted in order to determine the direction that a spill or surface runoff will most likely follow. Direction of drainage is determined from the analyses of the aerial photographs and from U.S. Geological Survey 7.5-minute quadrangle sheets.

Historical and current aerial photographs of the New Mexico and Texas hazardous waste sites were obtained from the sources listed in the following table:

TABLE 1. SOURCES OF ARCHIVAL AND CURRENT PHOTOGRAPHS

Site Name	Site Location	Geographic Coordinates	Date of Photo Acquisition	Photo Source
Albuquerque South Valley	Albuquerque, NM	35°03.0'N, 106°38.5'W	October 3, 1949	EROS
			November 11, 1951	EROS
			November 6, 1959	EROS
			September 20, 1967	EROS
			May 29, 1973	ASCS
			April 15, 1975	KP
Moore Drum Site	Hutchins, TX	32°38.1'N, 096°39.7'W	April 14, 1980	KP
			April 25, 1952	EROS
			September 18, 1968	EROS
			October 20, 1973	TX AERO
Pig Road Site	Maynard, TX	30°29.9'N, 095°19.9'W	March 17, 1976	TX HWY
			December 3, 1958	ASCS
			November 20, 1968	ASCS
			November 19, 1971	NASA
United Creosote	Conroe, TX	30°19.9'N, 095°27.4'W	December 5, 1982	EMSL-LV
			November 26, 1957	EROS
			November 19, 1971	NASA
			December 10, 1975	USFS
Magnolia Site	Magnolia, TX	30°12.6'N, 095°43.0'W	October 3, 1980	TX HWY
			November 4, 1982	EMSL-LV
			December 5, 1952	ASCS
			December 4, 1958	ASCS
Triangle/Red Bird Chemical Companies	Bridge City, TX	30°03.5'N, 093°48.3'W	November 11, 1968	ASCS
			November 21, 1975	TX HWY
			May 9, 1980	TX HWY
			November 4, 1982	EMSL-LV
Marshall Road Dump	Crosby, TX	29°54.6'N, 095°01.1'W	January 8, 1970	TX HWY
			December 16, 1978	ADAMS
			November 28, 1980	ASCS
			August 12, 1982	EMSL-LV
Sikes Disposal Pits	Barrett, TX	29°52.9'N, 095°05.2'W	October 24, 1982	EMSL-LV
			October 24, 1982	EMSL-LV
French Limited	Barrett, TX	29°52.3'N, 095°04.4'W	October 24, 1982	EMSL-LV
Geneva Industries	Houston, TX	29°39.6'N, 095°15.0'W	December 5, 1982	EMSL-LV

Photo source identification:

(ADAMS) Adams Aerial Surveys, Houston, Texas
 (ASCS) U.S. Department of Agriculture, Agricultural Stabilization and Conservation Service
 (EMSL-LV) U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Las Vegas
 (EROS) U.S. Department of the Interior, Earth Resources Observation System
 (KP) Koogle and Pouls Engineering, Incorporated, Albuquerque, New Mexico
 (NASA) National Aeronautics and Space Administration
 (TX AERO) Aero Service Corporation
 (TX HWY) Texas Department of Highways and Public Transportation
 (USFS) U.S. Department of Agriculture, U.S. Forest Service

Photographic prints made from all data sets are included within this report. The scales of these prints range between 1:1,000 (1 inch equals 83 feet) and 1:28,000 (1 inch equals 2,333 feet). All photographs are free of clouds and cloud shadows, and are of the best quality obtainable. Study area locations are shown on the Albuquerque, Dallas, Beaumont, Lake Charles, and Houston 1:250,000 topographic map sheets (Figures 1, 11, 17, 36, and 43). Site locations are depicted on the Albuquerque West, Hutchins, Maynard, Conroe NE, Conroe, Magnolia East, Orangefield, Crosby, Park Place, and Pasadena 7.5-minute topographic quadrangles (Figures 2, 12, 18, 23, 29, 37, 44, 46, and 49).

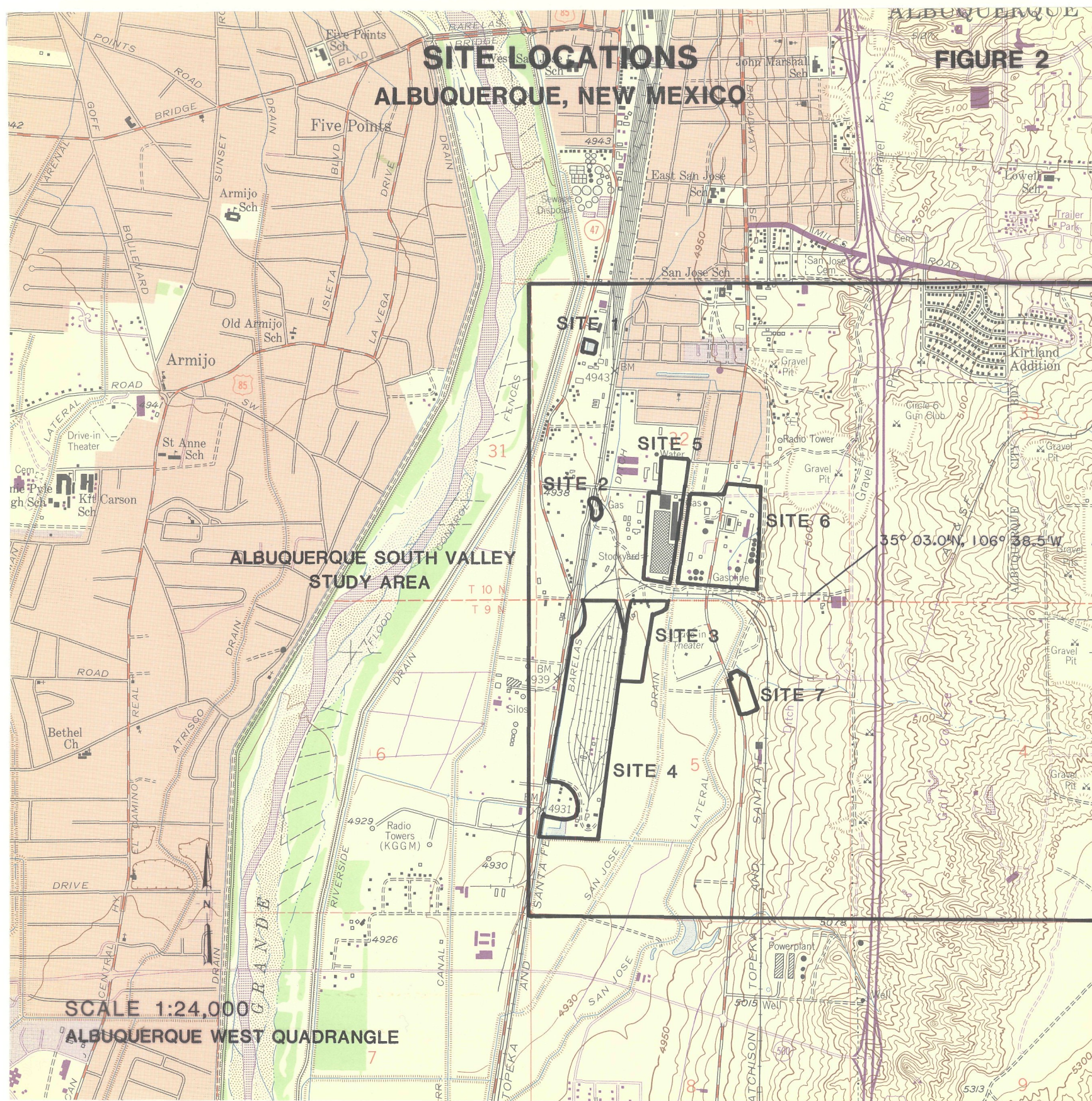
ALBUQUERQUE SOUTH VALLEY STUDY AREA

ANALYSIS SUMMARY

Information provided by the EPA's Region VI Environmental Services Division indicates that contaminants have entered groundwater within the Albuquerque South Valley (Figure 2), approximately 3 kilometers (2 miles) southwest of Albuquerque, New Mexico. Historical aerial photographs were used to conduct a search of the 10-square kilometer (4-square mile) area known as the Albuquerque South Valley Study Area. This project was performed in order to assist EPA Region VI in identifying possible sources of the reported contamination.

Aerial photographs that show the status of the Albuquerque south Valley Study Area between October 3, 1949, and April 14, 1980 (Figures 3 through 10), were used in this analysis. Seven sites were identified as suspected hazardous waste handling facilities. The sites included a large waste disposal pond which could not be associated with a specific facility (Site 1), a fuel distributor (Site 2), an unidentified facility with an on-site waste disposal area (Site 3), a wood treatment facility with associated storage tanks and waste disposal ponds (Site 4), a large unidentified industrial facility (Site 5), a bulk oil storage facility (Site 6), and a small waste disposal facility (Site 7). Sites 1 and 3 were present throughout the period of analysis.

Neither Site 1 nor Site 6 appeared to figure significantly in the contamination of the Albuquerque South Valley Study Area. The unlined waste pond at Site 1 was adequately bermed at all times throughout the analysis, and although some spillage was visible, no drainages appeared threatened. The bulk oil storage facility (Site 6) visible from November 1959 through April 1980 (Figures 6 through 10) had stains noted on the site at several times throughout the analysis. No evidence was found that would suggest that spillages from this site had entered the San Jose Drain or the San Jose Lateral.



Site 2, a fuel distributor present from October 1949 through November 1959 (Figures 3 through 6) contained several tanks, none of which were protected by earthen berms. Spillages from these tanks could have entered Barelvas Ditch. The wood treatment facility, Site 4, was in operation from October 1949 through some time subsequent to September 1967, but disappeared prior to May 1973 (Figures 3 through 8). Berms surrounded the two waste disposal ponds which were present, but most of the chemical storage tanks had no secondary containments. No spillages or stains were noted in the vicinity of these tanks, and it is unlikely that contaminants entered surface drainages located south and west of the site.

Stains visible adjacent to the San Jose Drain on a photograph that was collected on April 15, 1975 (Figure 9), suggest that contaminants from Site 5 may have entered the ditch. This site was in evidence within the study area from November 1959 through April 1980 (Figures 6 through 10).

Waste pits that were visible within Sites 3 and 7 suggest the possibility of on-site waste burial. Site 3 was first noted on the October 1949 photograph and remained visible through April 1980 (Figures 6 through 10). The waste disposal facility, Site 7, first became evident on the September 1967 photograph (Figure 7) and also remained visible through April 1980. Liquid accumulations, stains, rubble, and a small area that had been filled were present within the site on the April 1980 photograph.

PHOTO ANALYSIS

October 3, 1949, Photograph

Four suspected hazardous materials handling facilities are present within the study area (Figures 3 and 4). Site 1 is a large waste pond that is enclosed by a perimeter or security fence. An earthen berm surrounds the pond. The pond cannot be directly associated with any of the surrounding facilities. Site 2 appears to be a fuel distributor. Ten uncontained tanks are present at the facility. Site 3 is an unidentified facility in which two waste pits are present. Site 4 is a wood treatment facility as is evidenced by the piles of treated lumber. Wood treatment chemicals are probably stored within 10 uncontained storage tanks that are noted in the southern end of the site. Two large waste disposal ponds are located near the storage tanks.

All of the above sites are situated near drainage areas. Sites 2 and 4 have storage tanks that lack secondary containments and are considered major threats to nearby drainages. No spillages or spill stains are noted in the vicinity of the uncontained tanks.



November 11, 1951, Photograph

Few changes have occurred within the hazardous waste handling facilities (Figure 5) that were previously noted on the 1949 photographs. The storage tanks that were visible within Sites 2 and 4 remain uncontained. Again, there is no evidence of spillages or leakage. None of the four sites appeared to be discharging into the drainages at the time that this photograph was collected.



November 6, 1959, Photograph

No changes are noted within Sites 1 and 2 (Figure 6). A waste pit and a dump are present within Site 3. The reservoir that was previously visible within this site contains little waste and is being encroached upon by vegetation. Three storage tanks have been added to those that were present at the wood treatment facility (Site 4)-on the 1949 and 1951 photographs (Figures 3 through 5). The new tanks are enclosed within an earthen berm.

A large unidentified industrial facility (Site 5) and a bulk oil storage facility (Site 6) have been constructed subsequent to the 1951 photograph. The industrial facility abuts the San Jose Drain, and some identified stacked materials are present within the site. Forty-nine storage tanks are visible within the bulk oil storage facility, four of which lack secondary containments. No staining is noted in the vicinity of the tanks or at several loading racks that are also present.



September 20, 1967, Photograph

The waste pond at Site 1 is filled with a substance that appears powdery (Figure 7). Some of the substance has spilled out of the waste receptacle, but threatens no drainages at this time. All tanks that were visible at the fuel distributor (Site 2) have been removed, and the site no longer exists. Five disposal pits are visible along the eastern edge of Site 3, one of which contains some unidentified objects. A collection of rubble is also present within the site.

Few changes have occurred within Site 4. Stacked materials that were present within Site 5 on the 1959 photograph (Figure 6) have been removed. Spill stains are visible at several locations within the bulk oil storage facility, Site 6, but there is no indication that spills have entered nearby drainages. Four uncontained storage tanks that were present within the bulk oil storage area on the 1959 photograph have been removed. Two additional storage tanks have been added to the site.

A small waste disposal facility, Site 7, was established within the study area between November 1959 and September 1967 (Figures 6 and 7). Several dumps and an accumulation of dark liquid, which appears to have been disposed of within the facility, are visible.



May 29, 1973, Photograph

No changes are apparent within Sites 1 and 5 (Figure 8). A powdery substance that was visible at Site 1 on the 1967 photograph (Figure 7) remains visible. Stains are noted at Site 5, but their source cannot be determined from this photograph. Two new storage tanks have been added to those that were previously visible within Site 6.

Heavy ground scarring is present within Site 3. Four of the five waste pits that were visible along the eastern boundary of the site (Figure 7) are no longer present. Two piles of rubble and a small accumulation of liquid are noted within the site. Piles of rubble are also visible within Site 7. A highly stained area is noted near the center of Site 7. Previously (Figure 7), an accumulation of dark liquid was present at this location.

Lumber stockpiles, storage tanks, and waste ponds that were visible within the wood treatment facility (Site 4) during 1949, 1951, 1959, and 1967 (Figures 3 through 7) are no longer present. The site no longer appears to function as a wood treatment facility. The area in which the storage tanks and waste ponds were formerly located has been partially filled.

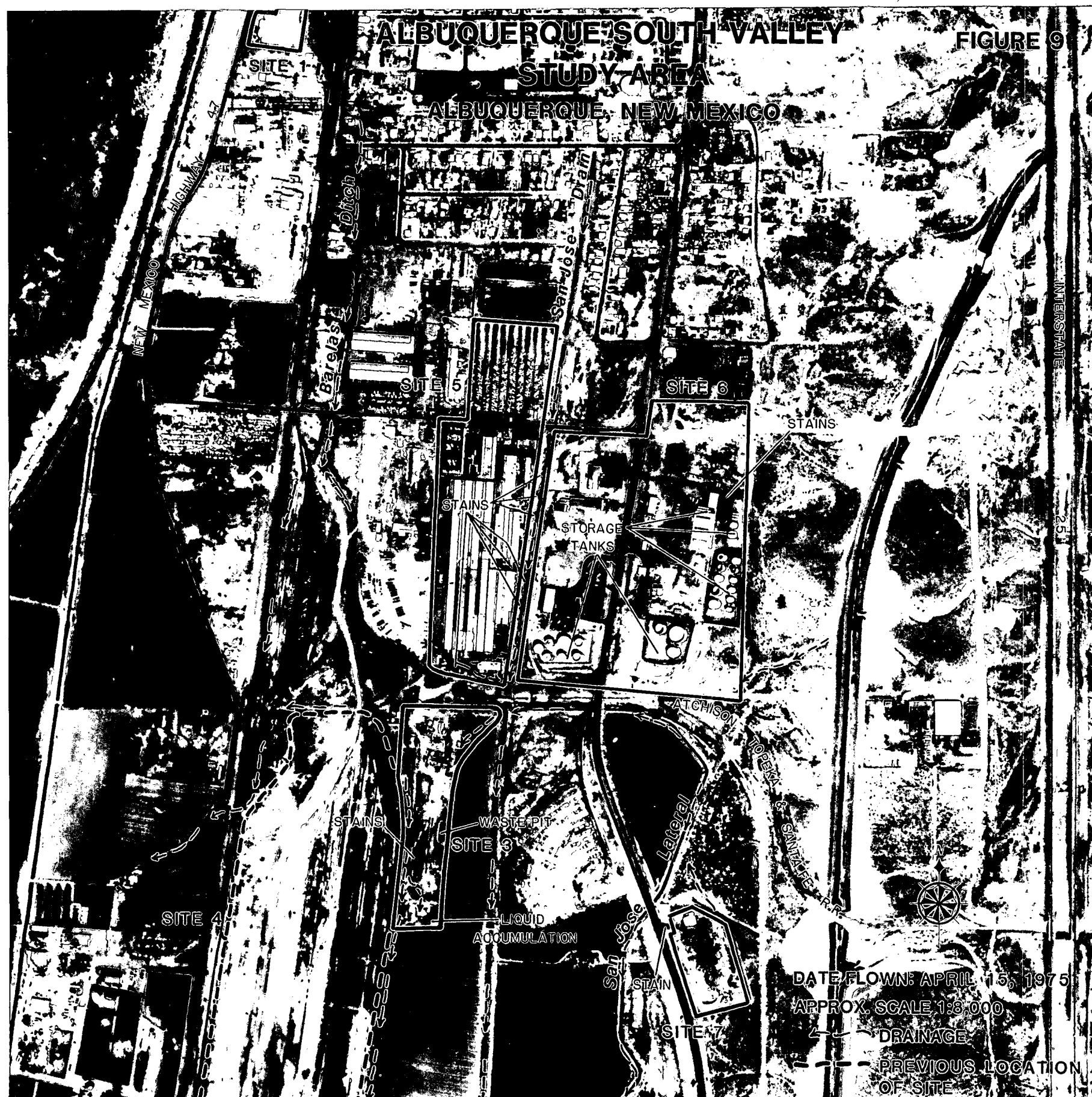


April 15, 1975, Photograph

No changes are in evidence at Site 1 (Figure 9). The waste pond still appears filled with a white powdery substance. Fewer ground scars are visible within Site 3 than noted on previous photographs. Scars are visible near the center of the site, within a stained area. The stains appear to lead towards a waste pit located in the southeast corner of the site in which a dark liquid has accumulated.

Stained areas are visible within Sites 5 and 6. Those visible along the western wall of the San Jose Drain may have had their origin at Site 5. It is possible that spillage from Site 5 may have entered the drainage ditch.

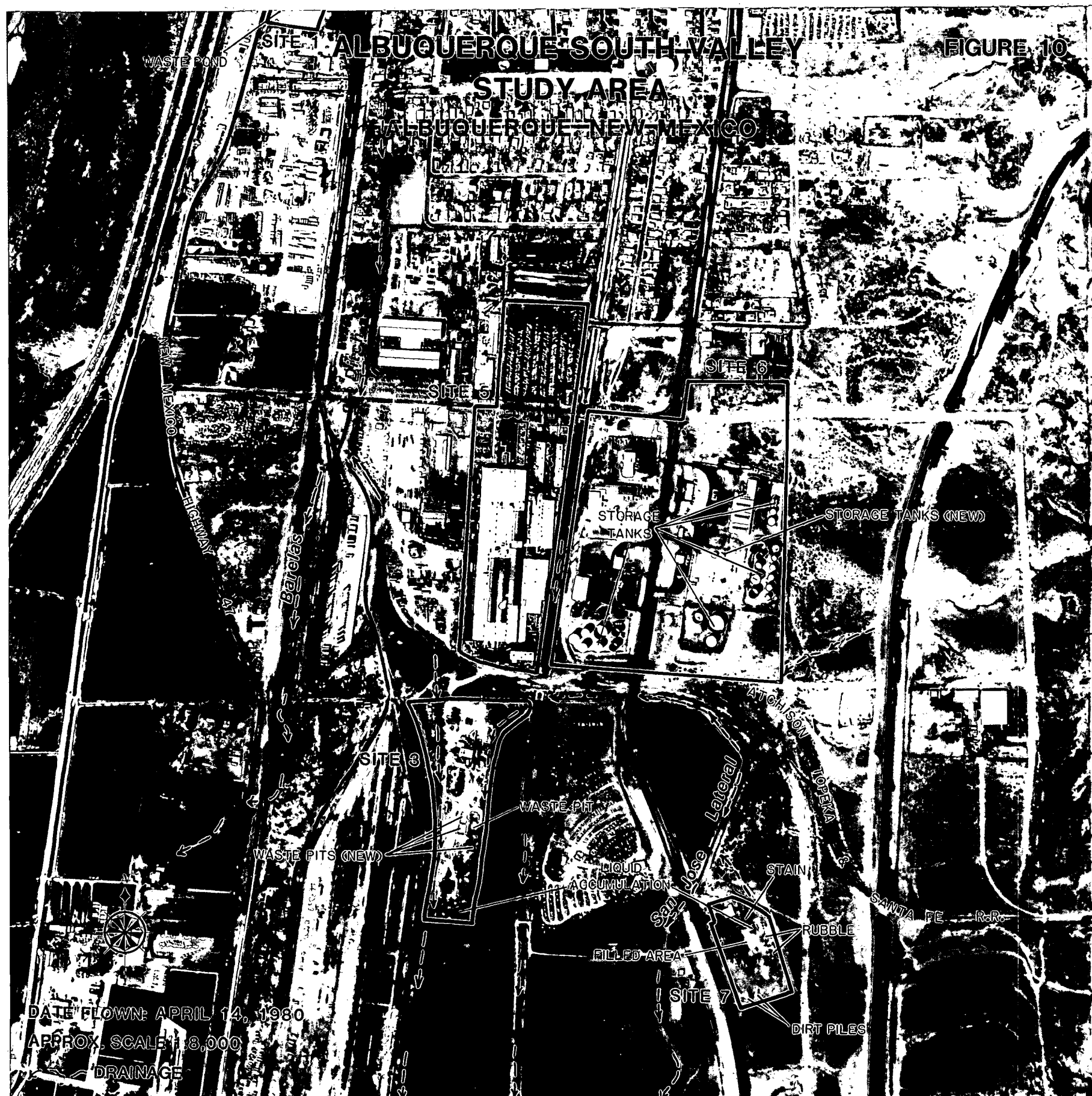
Liquid accumulations, rubble, and dumps that were visible within Site 7 during 1967 and 1973 (Figures 7 and 8) are no longer present. A stain which is noted outside of the site appears to be a water stain as opposed to a spill or seepage stain.



April 14, 1980, Photograph

No apparent changes are noted within Sites 1 and 5 (Figure 10). Four waste disposal pits are visible within Site 3, three of which were not present on the April 1975 photograph. An unidentified liquid has accumulated within a waste pit that is located in the southeast corner of the site. Liquid was previously visible within this pit on the April 1975 photograph (Figure 9).

An accumulation of liquid and a large stain are noted near the center of Site 7. Fill material appears to have been dumped in an effort to absorb or contain the flow of the liquid. Additional piles of dirt are visible elsewhere within the site. Several piles of rubble are also present.



MOORE DRUM SITE

ANALYSIS SUMMARY

This study area is located near Hutchins, Texas, approximately 16 kilometers (10 miles) southeast of Dallas, Texas (Figure 12). An intensive search was conducted to obtain historical aerial photographs which show the status of this site between 1930 and 1982. The search resulted in the four archival photos that are included within this report (Table 1).

No drums were visible on any of the photographs that were analyzed for this report (Figures 13 through 16). Ground scars and a small pit were in evidence on the April 25, 1952, photograph (Figure 13). Some stains and a small amount of damaged vegetation were also noted. Additional ground scars were visible on the March 17, 1976, photograph (Figure 16). A dump and small piles of rubble were present on photographs which were collected during April 1952, September 1968, and October 1973, respectively (Figures 13 through 15).

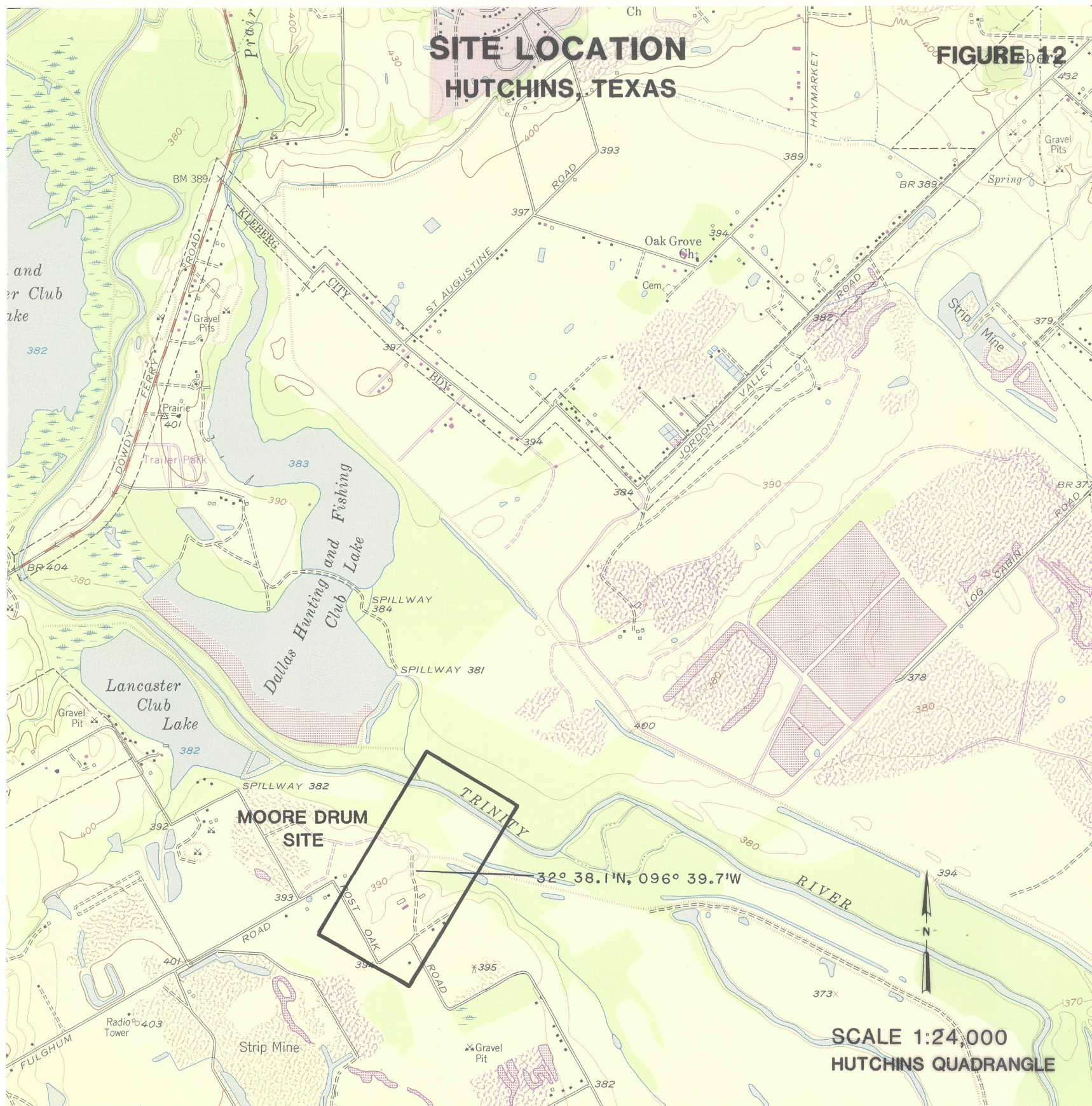
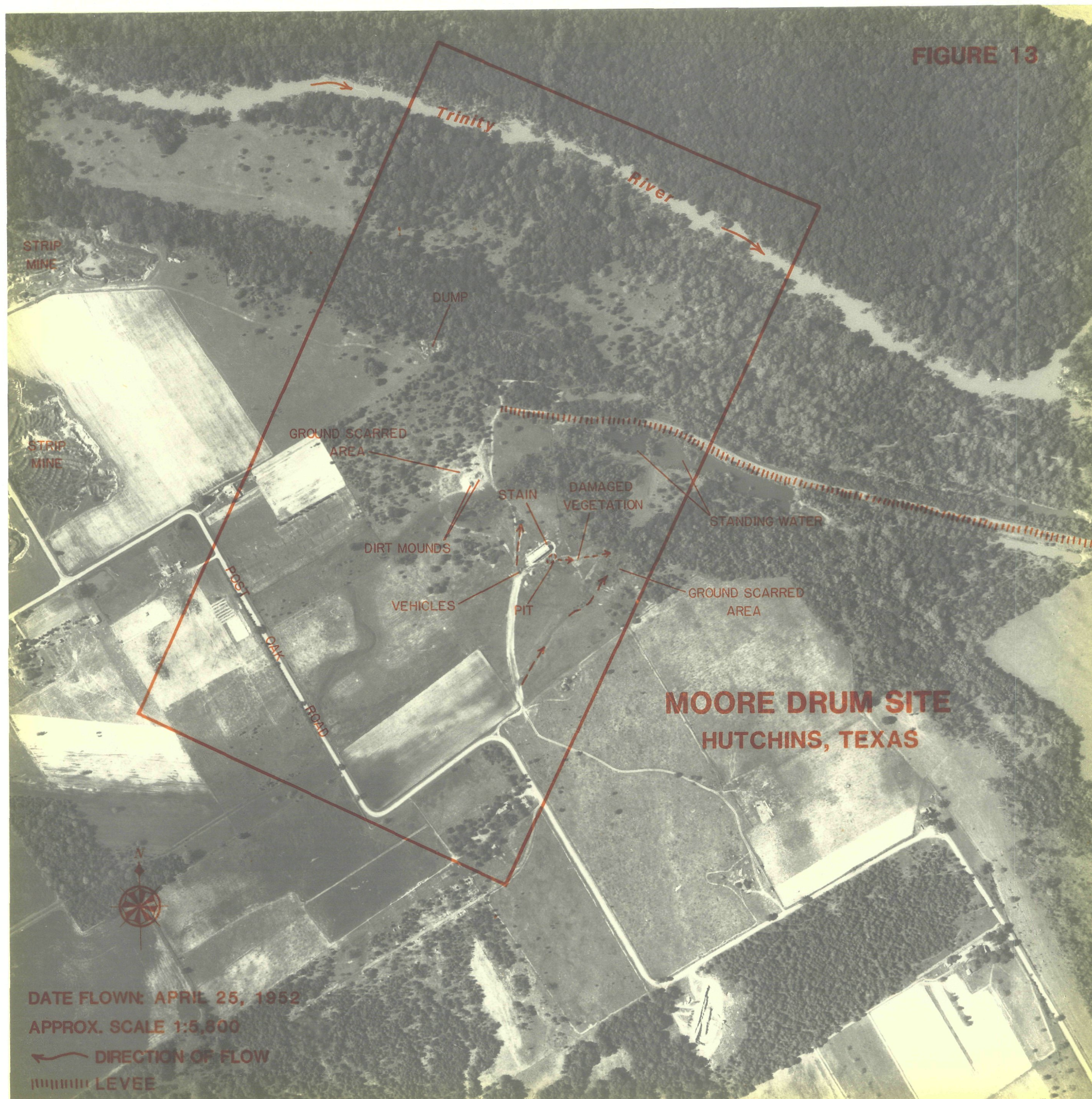


PHOTO ANALYSIS

April 25, 1952, Photograph

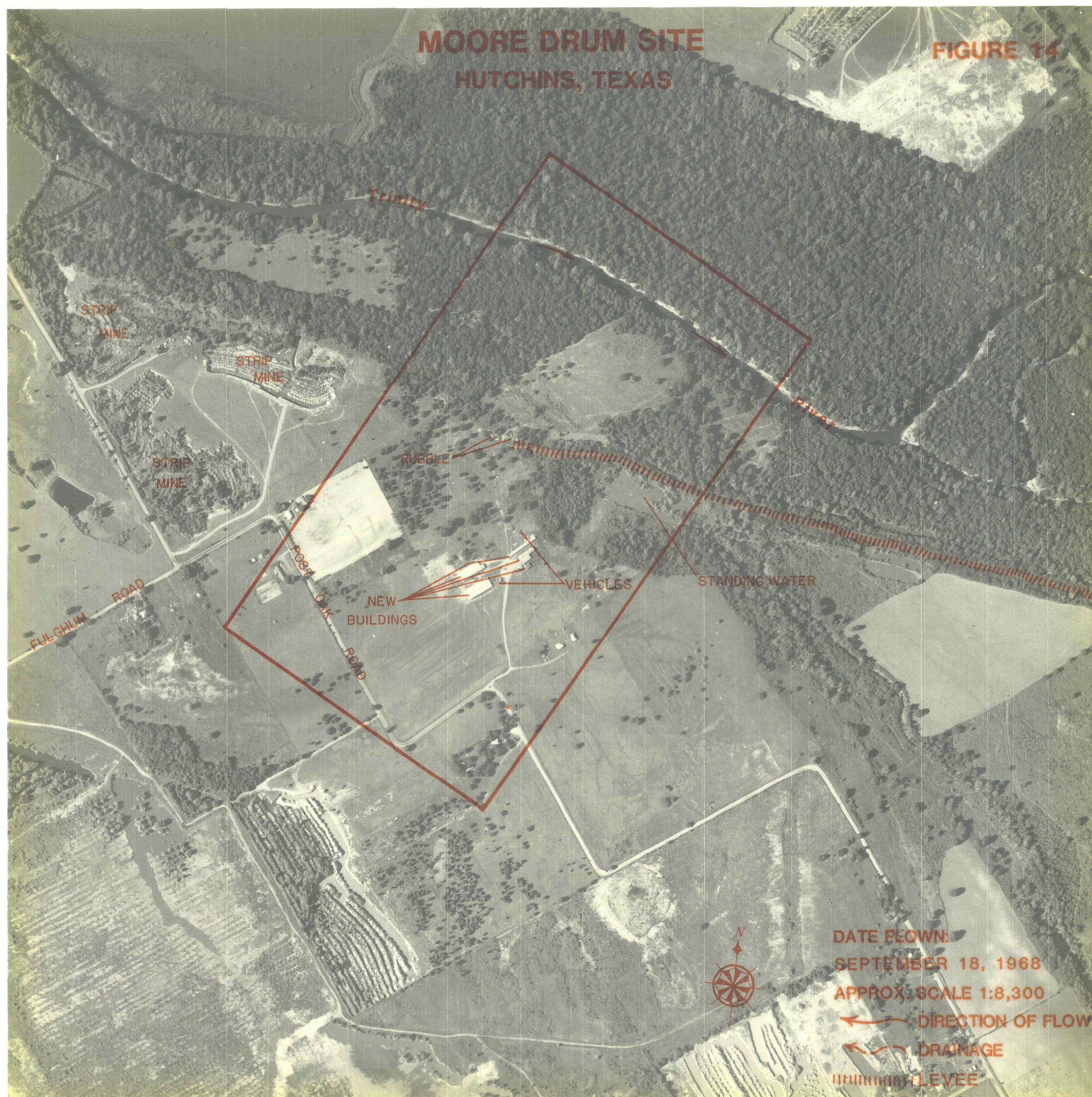
A stain is visible at the northwest corner of a warehouse-type building (Figure 13). A rectangular pit parallels the same building on its eastern side. Drainage leads away from this pit towards a ground-scarred area that has partially revegetated. Damaged vegetation that is visible along this drainage path suggests that liquid wastes may have flowed out of the pit into the ground-scarred area. A second ground-scarred area and an oil dumping area are also noted, northwest of the warehouse-type building. Two mounds of dirt, visible within the ground-scarred area, indicate that the area was probably active at the time that this photograph was collected. Scars are visible within the vegetation that has encroached upon the old dump.

Two accumulations of standing water are present within the study area. Drainage from the drum site could possibly flow into these accumulations. An earthen levee that is situated between the site and the Trinity River should prevent contaminated liquid from entering the Trinity River.



September 18, 1968, Photograph

The warehouse-type building and an adjacent pit that were visible on the 1952 photograph are no longer present in Figure 14. Five new buildings have been constructed within the site, two of which are double-bay structures. Ground-scarred areas and an old dump which were also visible on the the 1952 photograph (Figure 13) have been overgrown with vegetation. Two piles of rubble that were not present on the 1952 photograph are noted within a dumping area.



October 20, 1973, Photograph

Few changes have occurred within the site subsequent to the September 1968 photograph (Figure 15). A single pile of rubble remains visible within a dumping area that was previously noted on the 1968 photograph.



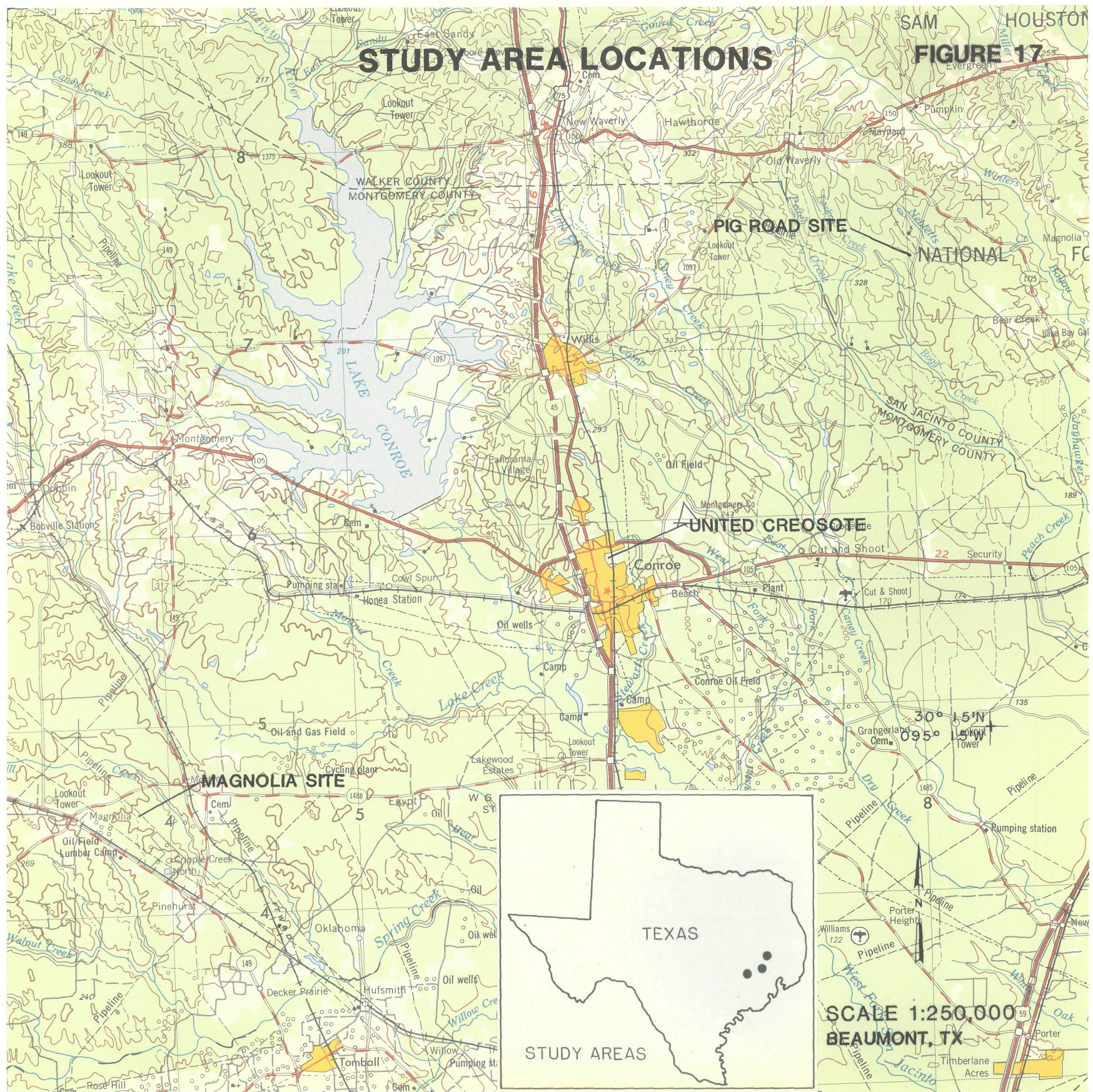
March 17, 1976, Photograph

A building that was visible on the October 1973 photograph has been dismantled (Figure 16). No other structural changes have occurred within the site.

Ground scars are visible within an area in which rubble had previously been dumped (Figures 13 through 15). No rubble is noted at this time, and the area has continued to return to its former vegetative state.

FIGURE 16





PIG ROAD SITE

ANALYSIS SUMMARY

This site consists of six waste disposal ponds that are located south of Maynard, Texas, approximately 24 kilometers (15 miles) northeast of Conroe, Texas (Figure 18). Several drainages which could allow seepage or overflow to more southward towards Turkey Creek are noted in the vicinity of the disposal area.

Aerial photographs that were collected during December 1958, November 1968, November 1971, and December 1982 (Figures 19 through 22) were used to conduct an intensive analysis of the disposal area. The disposal ponds were visible as early as December 1958 (Figure 19) and remained so through December 1982 (Figure 22). All ponds were individually bermed, and no breaches were visible within the berm walls on either the November 1968 or November 1971 photographs (Figures 20 and 21). The November 1971 photograph (Figure 21) did reveal that there was probably an interchange of liquid between the ponds caused by overflow. This condition was evidenced by the almost total disappearance of the berms that separated the individual ponds. It could not be ascertained as to whether waste liquid had flowed out of the ponds into the surrounding terrain.

Photographs collected during December 1982 (Figure 22) revealed the presence of several breaches within the berm walls. The breaches probably resulted in an exchange of liquid between at least two sets of waste ponds. Although a breach was noted in the northwest corner of Pond 1, there was no indication that waste liquid had flowed out of the pond. Several stains, which may not be connected with the disposal ponds, a pit, and three areas in which material had been dumped, were also noted on the photograph.



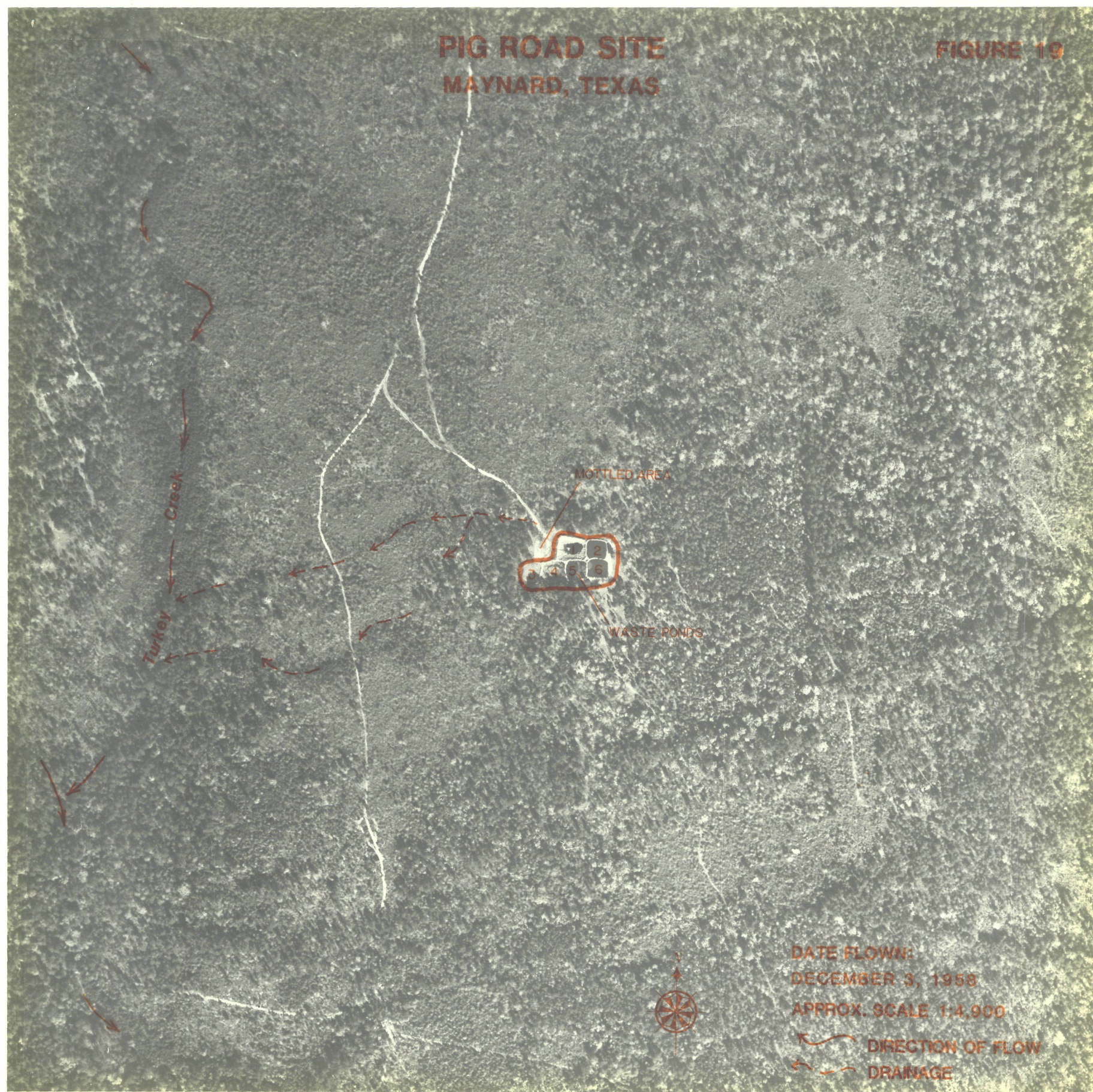
PHOTO ANALYSIS

December 3, 1958, Photograph

A series of six interconnected waste ponds are present, five of which contain an unidentified liquid (Figure 19). The ponds are individually bermed, and no breaches in the berms are evident. A mottled area is located adjacent to the ponds. This pattern appears to be created by several bare areas that are visible within the vegetative cover.

PIG ROAD SITE
MAYNARD, TEXAS

FIGURE 19

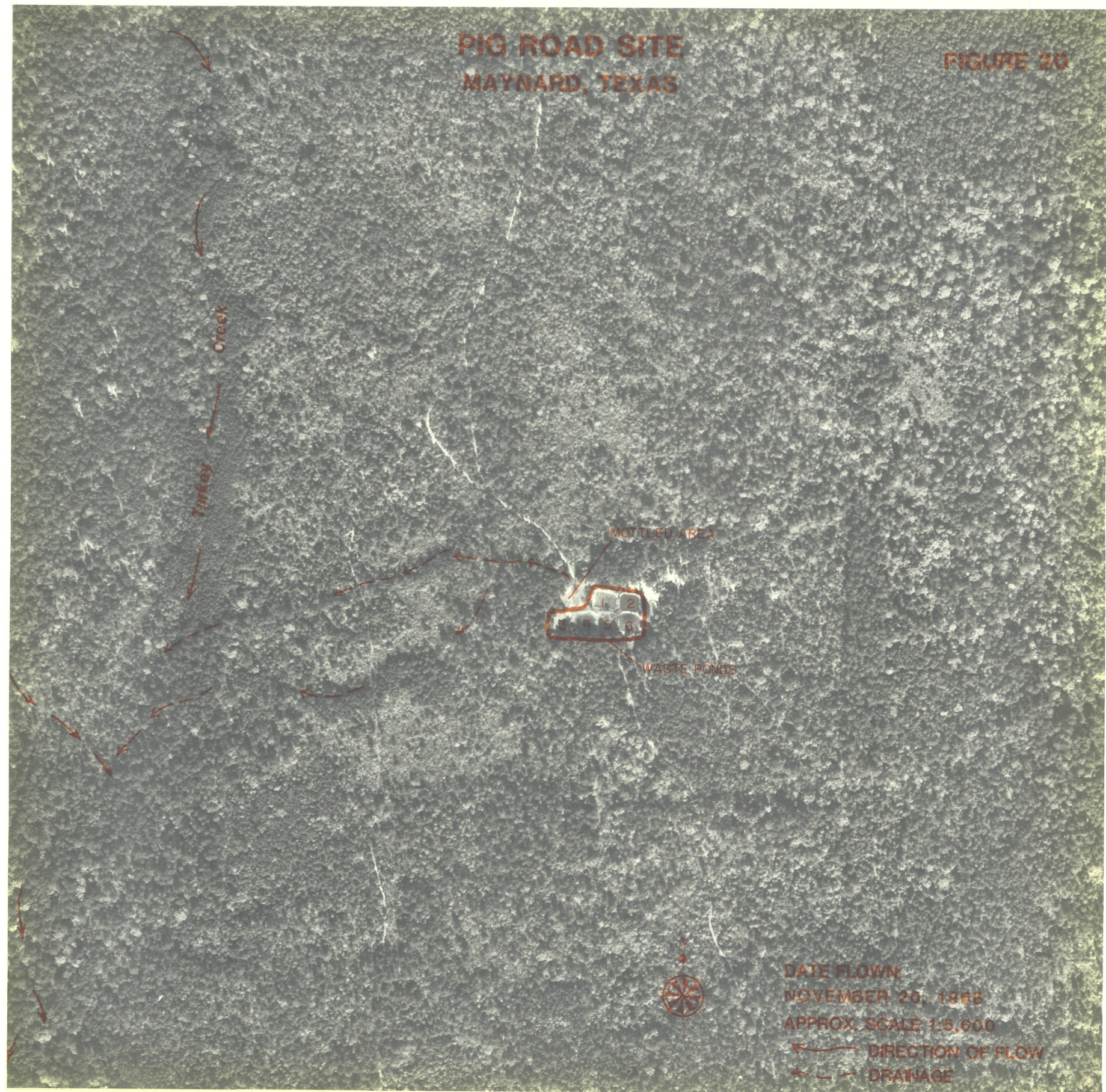


November 20, 1968, Photograph

All waste ponds that were present on the December 1958 photograph (Figure 19) remain visible. For the most part, the ponds appear to contain less liquid than they did on the 1958 photograph.

PIG ROAD SITE
MAYNARD, TEXAS

FIGURE 20



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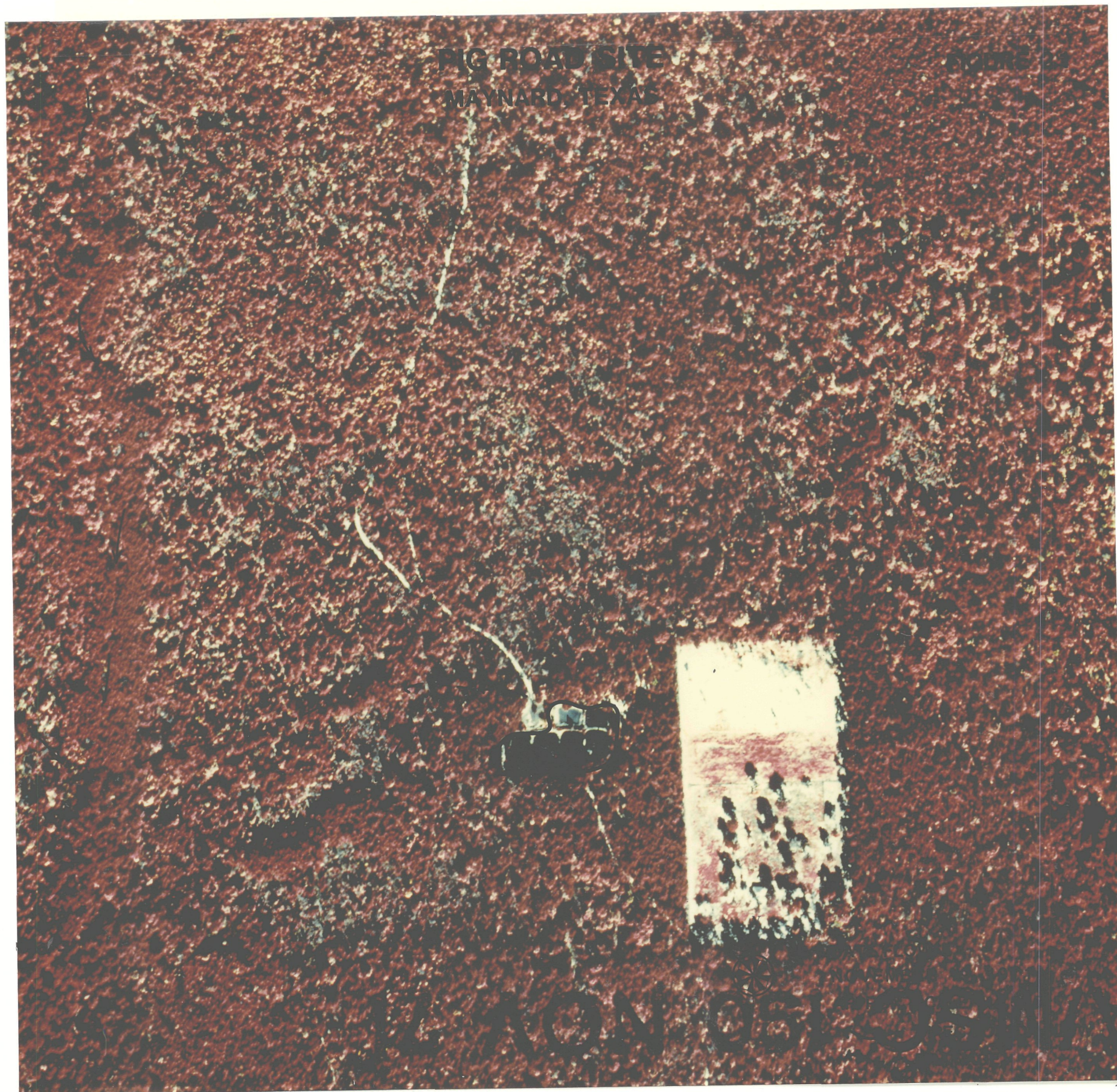
**PIG ROAD SITE
MAYNARD, TEXAS**

FIGURE 22



November 19, 1971, Photograph

All of the waste ponds, with the exception of Pond 1, appear to be filled to capacity (Figure 21). Only a portion of the individual berms that separated the ponds remain visible. This suggests that the ponds have spilled over into one another. Overflow cannot be seen outside of the contained areas on the northern, western, or eastern sides of the site. Tree shadows mask the southern boundary of the site, and it cannot be determined whether overflow has entered the area south of the site.



December 5, 1982, Photograph

Breaches are visible within several berm walls (Figure 22). Waste liquids appear to be passing between ponds 1 and 2, and between ponds 4 and 5. There is no indication that liquid held within pond 1 has flowed out of two breaches that are present at the northwest corner of the pond. Stains are visible in two areas located outside the southern boundary of the waste ponds. It cannot be determined whether waste liquid has leached out of the ponds, resulting in the stains.

A large area located south of the waste ponds has been stripped of a good portion of its vegetative cover. A moisture-stained pit, an old dump, and two piles of an unidentified dumped material are present within the denuded area. Accumulations of what appears to be standing water are also noted.

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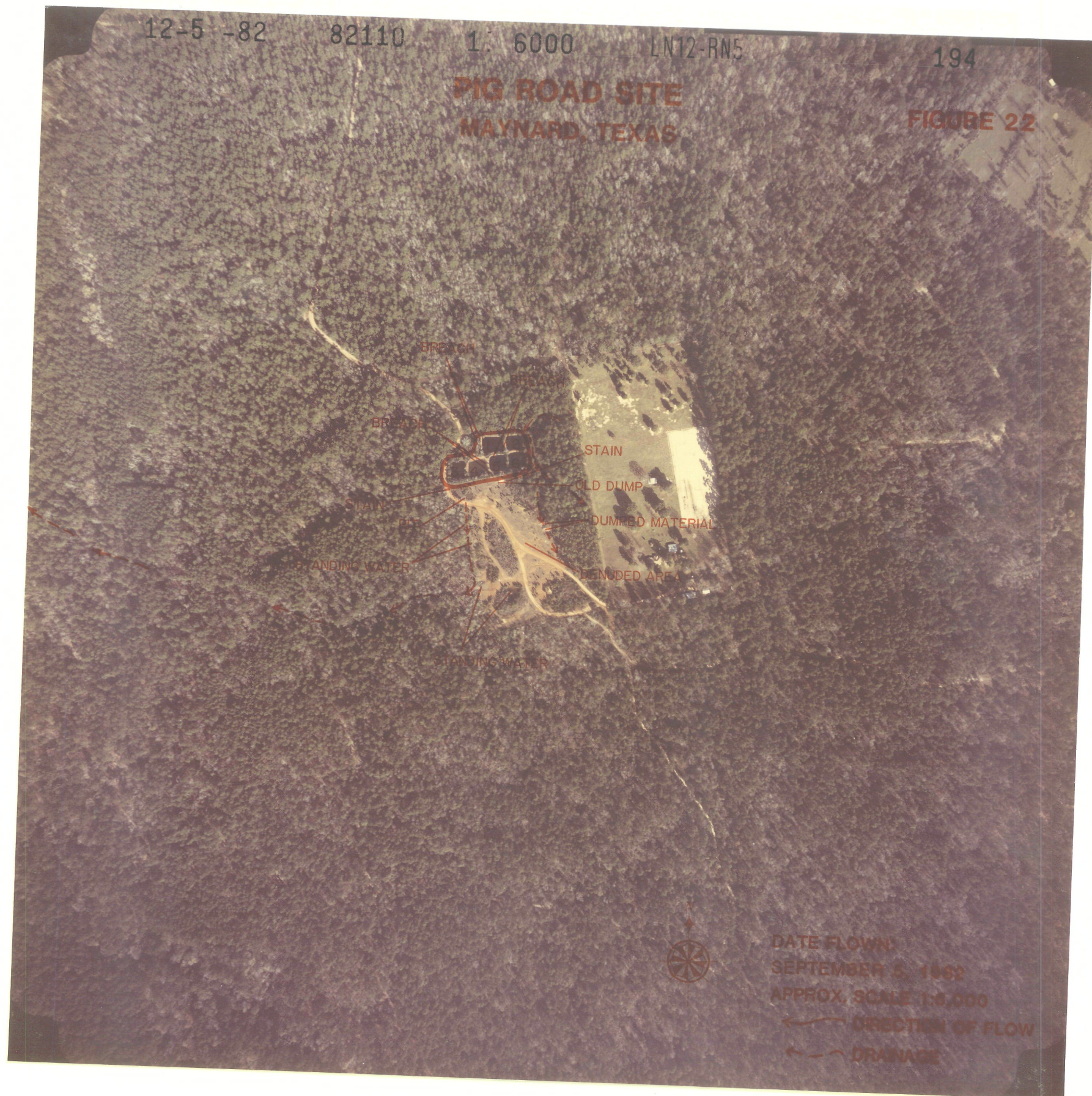
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**PIG ROAD SITE
MAYNARD, TEXAS**

FIGURE 22



UNITED CREOSOTE

ANALYSIS SUMMARY

This site is a former wood treatment facility that was located at Conroe, Texas (Figure 23). Aerial photographs that were collected during November 1957, November 1971, December 1975, October 1980, and November 1982 (Figures 24 through 28) were used to conduct an intensive analysis of the facility. The photographs revealed that the creosoting facility began operations prior to November 26, 1957 (Figure 24), and ceased operations prior to October 3, 1980 (Figure 27).

Throughout the period in which the creosoting facility was in operation, wastes were probably stored on-site within several waste ponds and pits that were present (Figures 24 through 26). Few drainages were noted on the photographs. By October 1980 (Figure 27) all vestiges of the creosoting facility had been removed. A residential development and a commercial facility were constructed upon the property that previously encompassed the creosoting facility. No visible changes occurred within the study area between October 1980 and November 1982 (Figure 28).

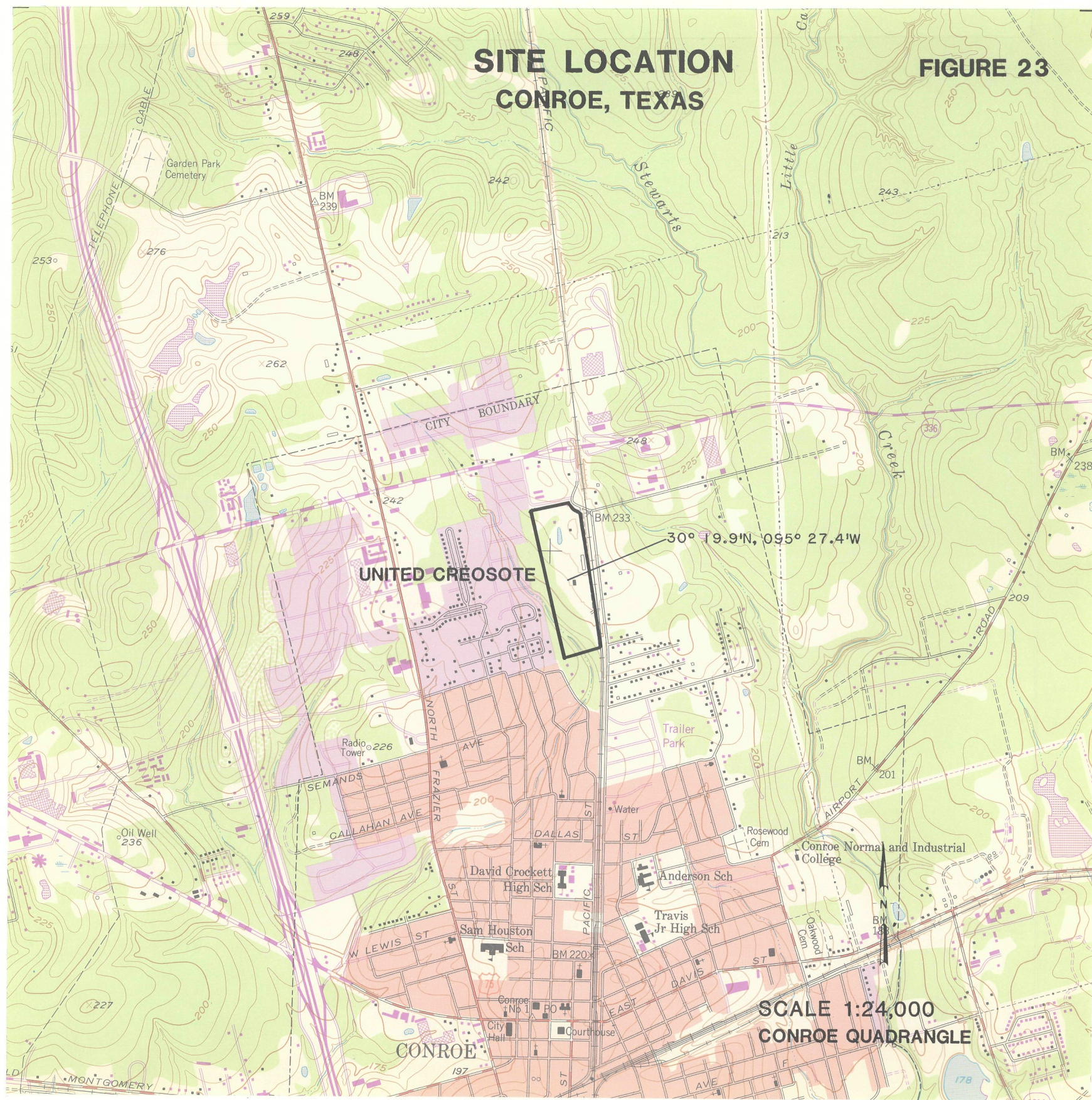


PHOTO ANALYSIS

November 26, 1957, Photograph

Three buildings are present within the creosoting facility (Figure 24), one of which appears to be the coal-tar distillation still, and one of which appears to contain the pressure cylinder. The third building is most likely a processing building. Piles of treated lumber are visible throughout the site.

Several objects that appear to be cylindrical tanks are present at the northern end of the coal-tar distillation still. An uncontained storage tank is noted in the same vicinity. Liquid wastes are apparently disposed of within two ponds that are present within the northern section of the site. Stains are noted near the ponds and at the pressure cylinder. No drainages that could be threatened by spillages are apparent on this photograph.



November 19, 1971, Photograph

The northern half of the creosoting facility is visible on this photograph (Figure 25). A single waste pond is present where two were visible during November 1971. The berm which separated the two ponds has been removed or has been overflowed. Two waste pits that were not present on the November 1971 photograph (Figure 24) are visible on the current photograph. The pits appear to be concrete-lined, and are filled with an unidentified dark substance.

Stains are noted in the vicinity of a large tank that is located east of the coal-tar distillation building. Additional stains are noted near several tanks that are situated at the northern end of the same building. An accumulation of liquid has collected within a ditch located along the western side of the Missouri Pacific Railroad system. This accumulation may be fed by spillage from the uncontained tanks which are present within the site.

Rubble and/or other solid wastes have been dumped into two areas. The southernmost dumping area shows signs of considerable vegetative stress.



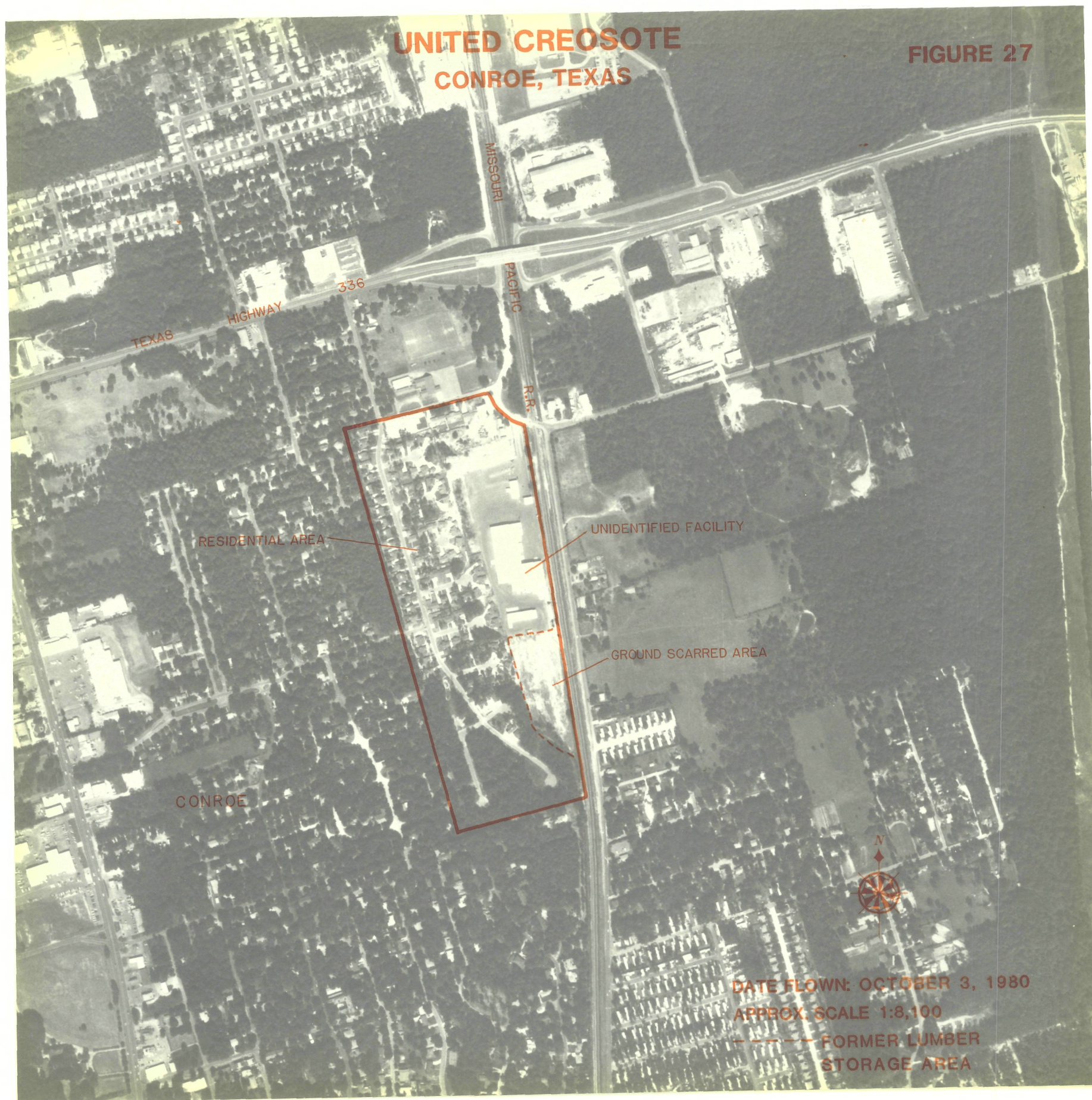
December 10, 1975, Photograph

Most of the structures that were visible on the November 1957 and November 1971 photographs, Figures 24 and 25, have been removed (Figure 26). The waste pond and lined pits that were present on the 1971 photograph are still visible. A third pit is noted on the former site of the coal-tar distillation still. Piles of rubble and stains are also noted within the creosoting facility. The stains suggest the possibility of leachate or seepage from buried wastes that may be located on the site.



October 3, 1980, Photograph

All structures that formerly were associated with the creosoting facility have been removed (Figure 27). An unidentified facility and a residential area have been constructed upon the former site of the creosoting facility. A heavily scarred area that was formerly used for the storage of treated lumber may be a disposal or storage area for the unidentified facility.



November 4, 1982, Photograph

The property upon which United Creosote was formerly located appears much the same as it did on the 1980 photograph (Figure 28). The scarred area appears more moist than it did on the earlier photograph (Figure 27), a factor that may be attributed to seasonal rainfall. Two piles of rubble are noted at the juncture of the scarred field and paved area.



MAGNOLIA SITE

ANALYSIS SUMMARY

This site is a waste disposal area that is located approximately 3 kilometers (2 miles) east of Magnolia, Texas (Figure 29). An intensive analysis of the disposal site was conducted using aerial photographs which showed the status of the study area at various times between December 5, 1952, and November 4, 1982 (Figures 30 through 35).

The disposal area came into existence at some time between December 5, 1952, and December 4, 1958 (Figures 30 and 31). The December 1958 photograph revealed that the site initially consisted of a waste disposal trench and a pit which was probably used for some type of waste disposal. The site was surrounded by a built-up area which was breached. The disposal trench remained visible through November 1968 (Figure 32) but had disappeared by November 1975 (Figure 33). The suspected waste pit remained visible throughout the entire period of analysis.

Drum concentrations were first noted at the site on the November 1975 photograph (Figure 33). At that time there were approximately 100-150 drums present. Although the scale of the May 9, 1980, photograph (Figure 34) was somewhat limiting, objects that appeared to be drums were identified on the photograph. Approximately 150-250 drums were present at the site as of November 4, 1982 (Figure 35). At no time during the analysis of the disposal site were contaminants observed within drainage areas.

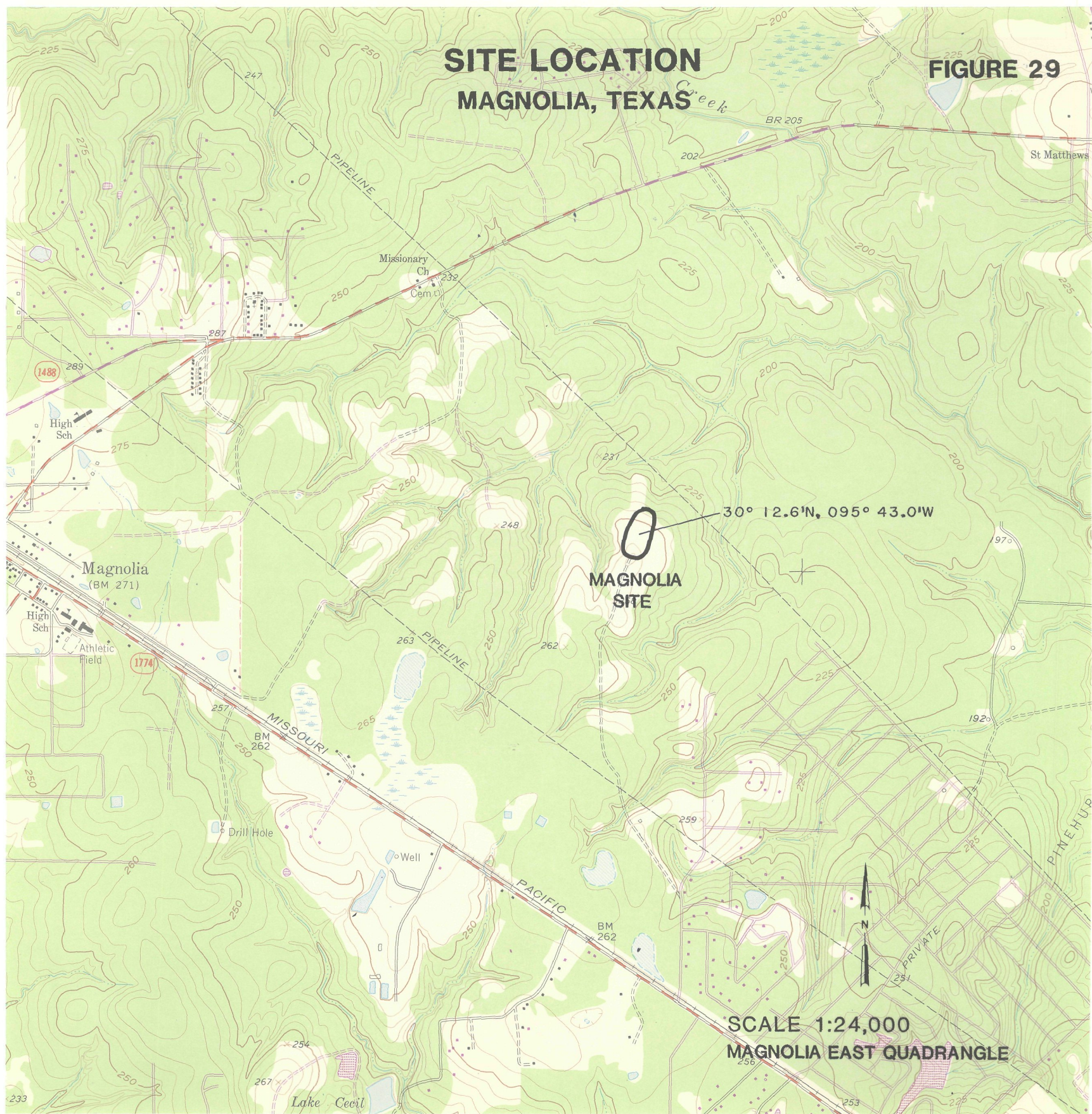


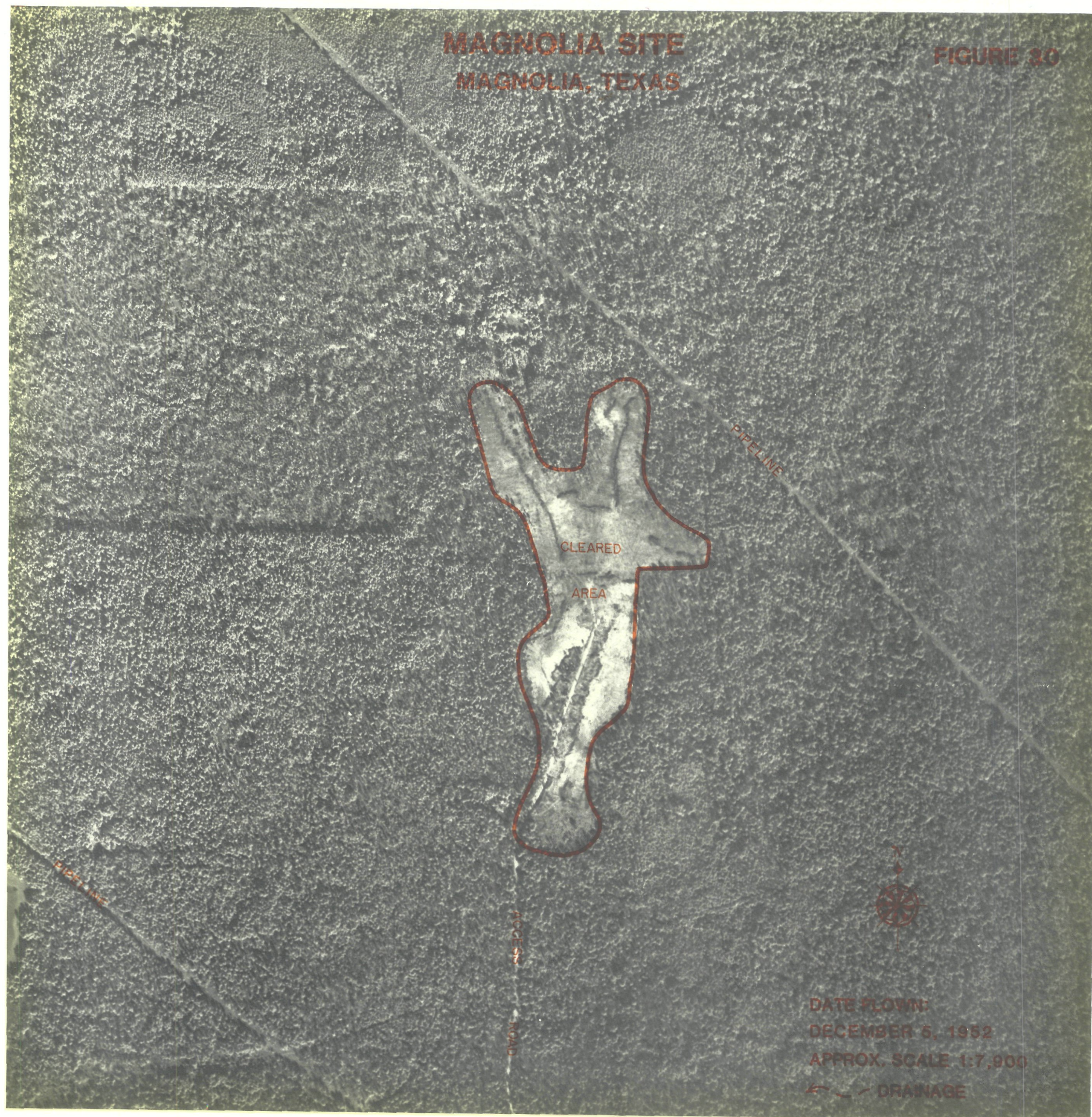
PHOTO ANALYSIS

December 5, 1952, Photograph

A large clearing has been cut out of a heavily forested area (Figure 30). The area is serviced by an access road that leads northward from Farm-to-Market Road 1774. No evidence of waste disposal is noted on the photograph.

MAGNOLIA SITE
MAGNOLIA, TEXAS

FIGURE 30



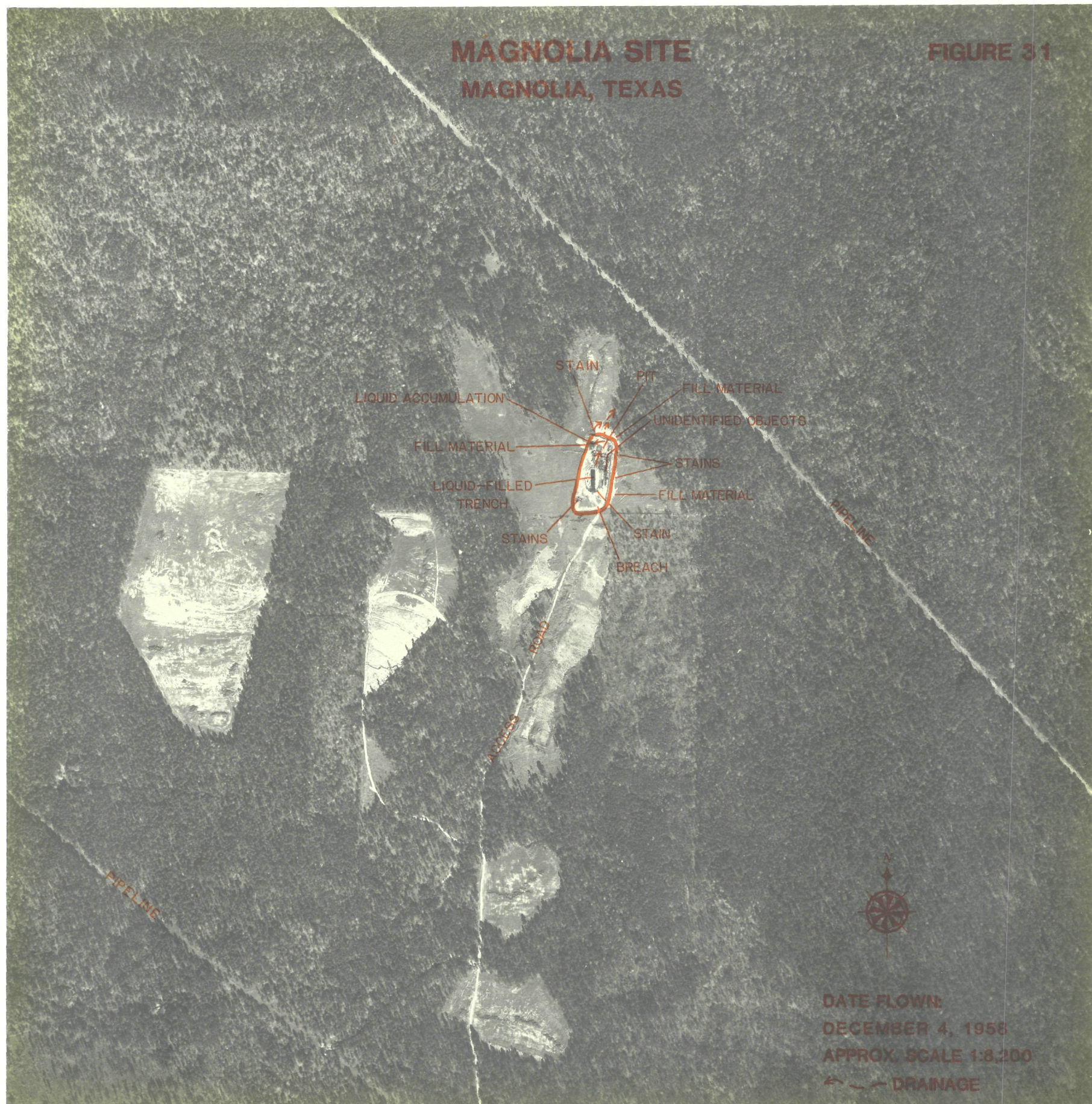
December 4, 1958, Photograph

A waste disposal area (Figure 31) is visible within a clearing that was previously noted on the 1952 photograph. A soil buildup that surrounds the disposal area has been breached in order to allow vehicular access to the site. Stains and fill material that are visible outside the built-up area suggest that waste materials may have flowed off the site.

A large liquid-filled trench and a horseshoe-shaped pit are present within the site. Stains visible at the southern end of the trench suggest spillage and/or overflow of the contents within the trench. Additional stains are noted within the horseshoe-shaped pit and amid a gathering of unidentified objects which are also present at the site. An accumulation of liquid is also visible.

MAGNOLIA SITE
MAGNOLIA, TEXAS

FIGURE 31

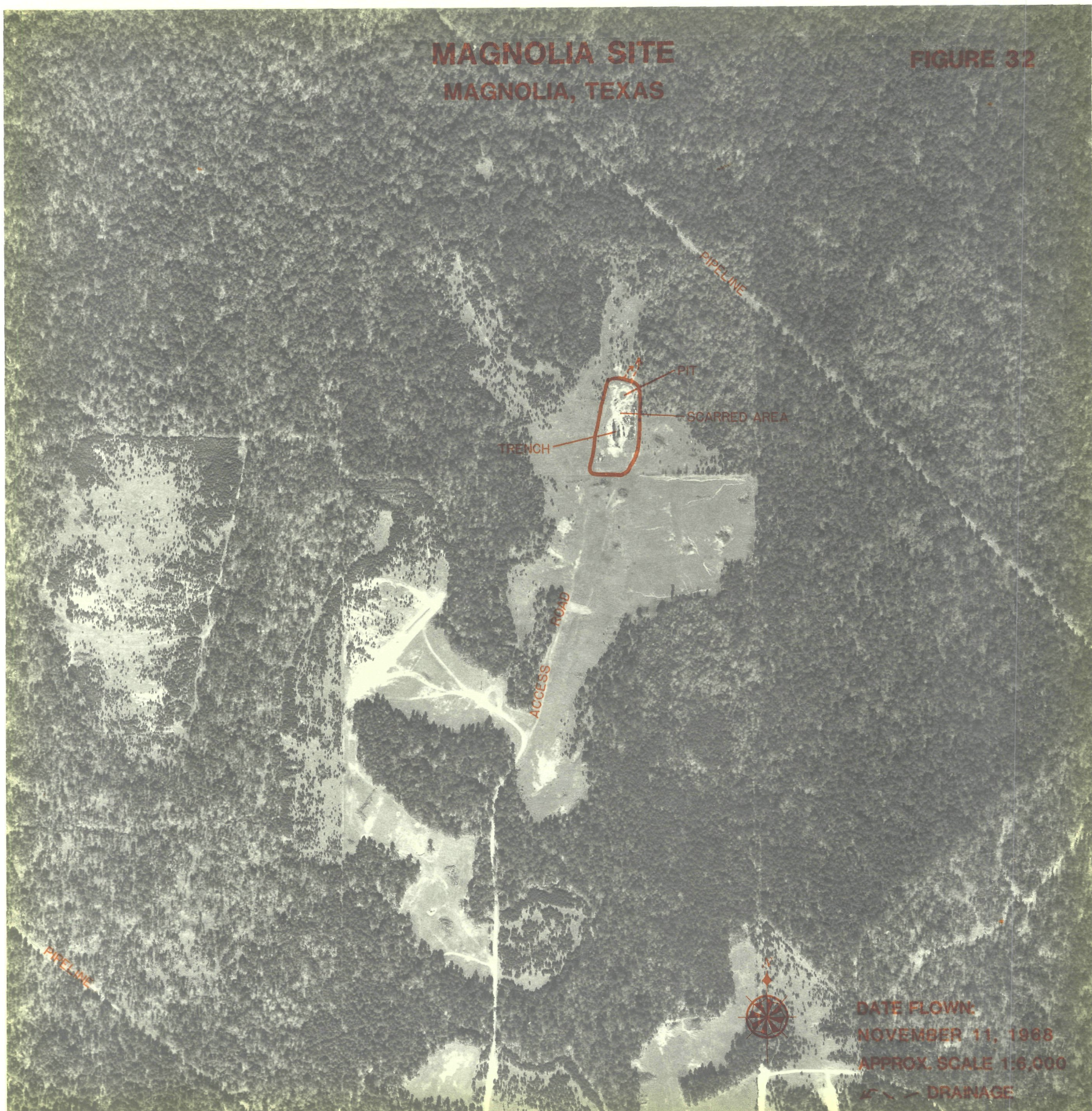


November 11, 1968, Photograph

Much of the access road that leads into the disposal area has become overgrown with vegetation, indicating a possible lack of use (Figure 32). The liquid-filled trench that was noted on the December 1958 photograph (Figure 31) has been drained. Considerable scarring is visible within areas that are adjacent to the trench. The horseshoe-shaped pit visible on the 1958 photograph has been fully bermed into a circular shape. The center of the bermed area appears stained.

MAGNOLIA SITE
MAGNOLIA, TEXAS

FIGURE 32



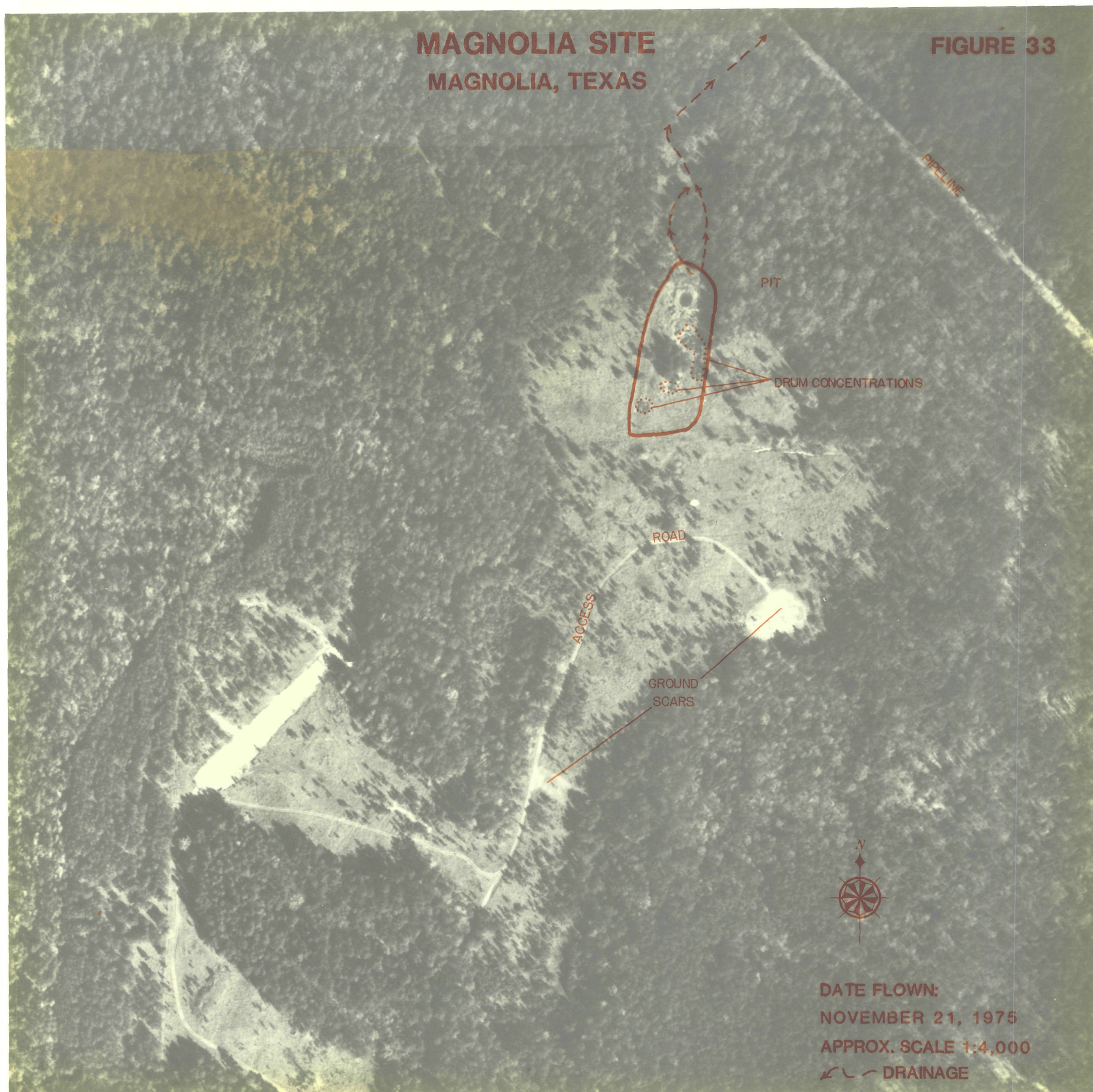
November 21, 1975, Photograph

Approximately 100-150 objects that appear to be drums have been discarded within the site (Figure 33). No leakages or spillages are noted.

Two ground-scarred areas are visible along a road which formerly provided access to the drum site. It is not possible to determine the type of activity that may have occurred within the scarred areas.

**MAGNOLIA SITE
MAGNOLIA, TEXAS**

FIGURE 33



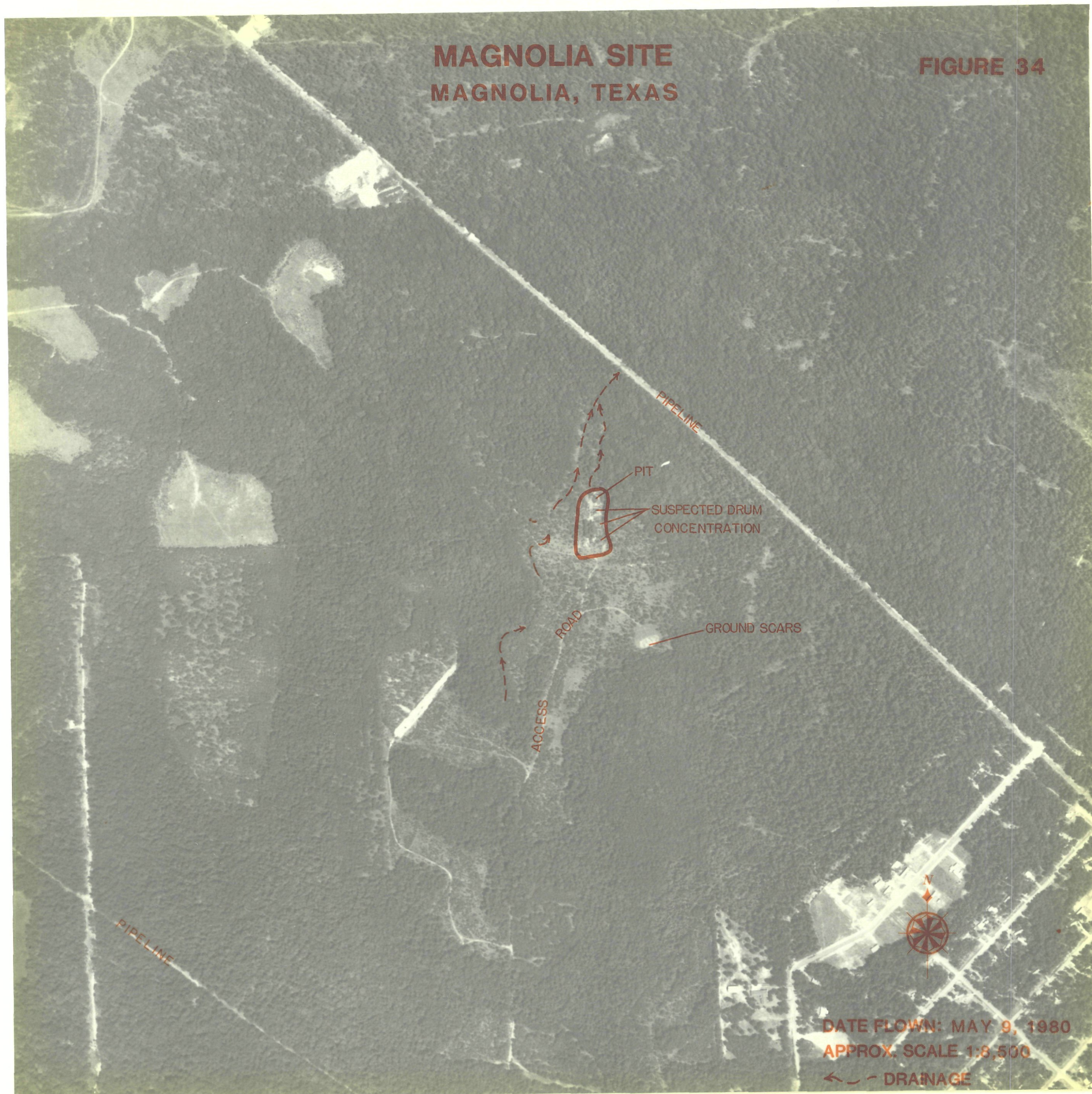
May 9, 1980, Photograph

The drum site appears much the same (Figure 34) as it did during November 1975. Objects which may be drums are again noted; however, the scale and quality of this photograph hinder further analysis of the suspected drums.

One of two heavily scarred areas that were noted along the site access road on the 1975 photograph (Figure 33) has been completely overgrown with vegetation. Some scars remain visible at the second area, but it too is returning to its vegetative state.

**MAGNOLIA SITE
MAGNOLIA, TEXAS**

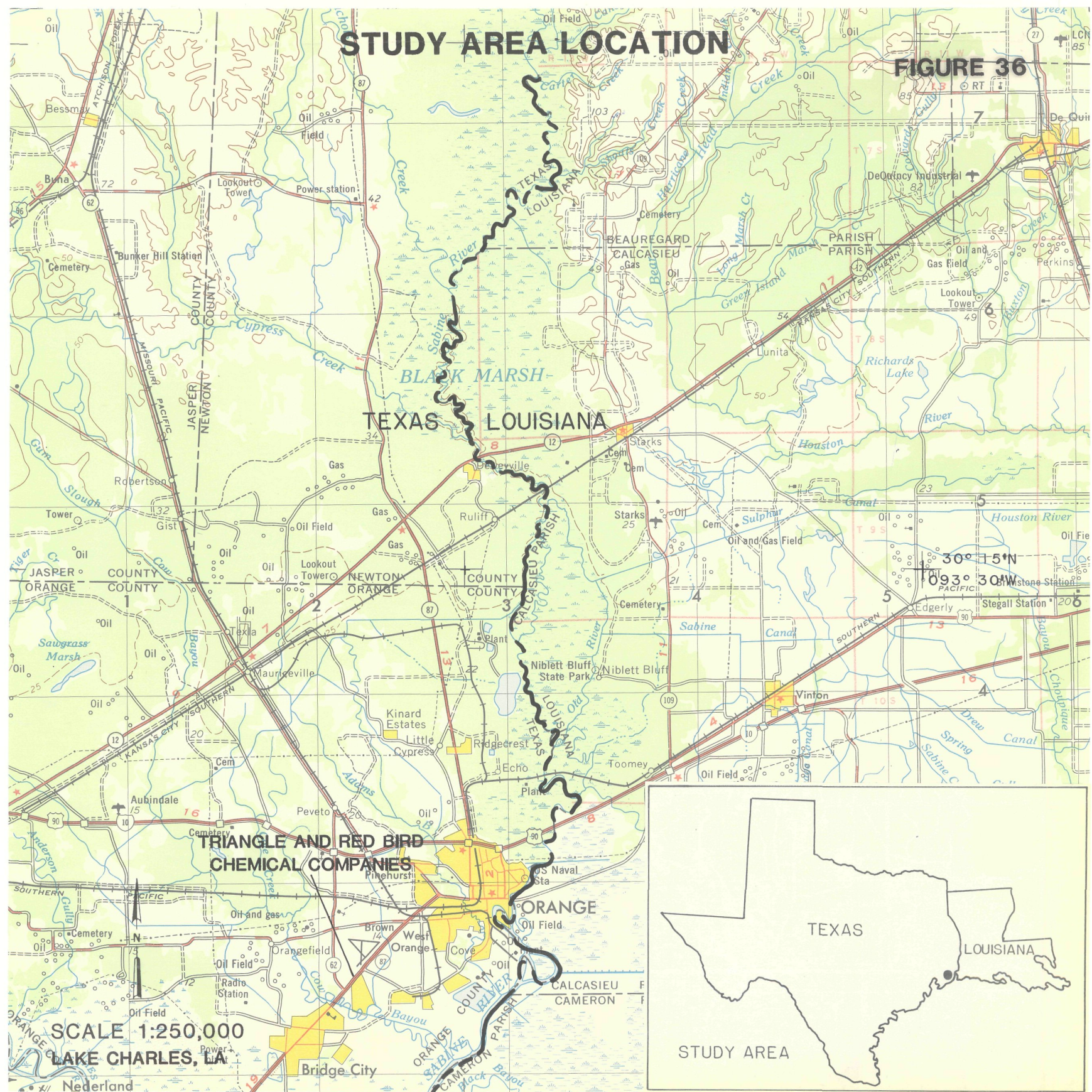
FIGURE 34



November 4, 1982, Photograph

Approximately 150-200 drums appear to have been discarded within the disposal area (Figure 35). Stains visible in the vicinity of the drums suggest that some of the contents of the containers may be seeping out. Contaminants do not appear to have entered surface drainages. Liquid contained within an old pit that has been visible since December 4, 1958 (Figure 31), may be rainwater.





TRIANGLE AND RED BIRD CHEMICAL COMPANIES

ANALYSIS SUMMARY

The chemical companies are located side-by-side at Bridge City, Texas (Figure 37). The Triangle Chemical Company was a producer of antifreeze, windshield wash solvents, industrial cleaners, and brake fluids. At some time during 1981, the company declared bankruptcy and abandoned the facility. Approximately 900 drums and several large tanks were left at the facility. A waste removal action was initiated by the U.S. Environmental Protection Agency under the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) between August and September 1982.

Aerial photographs collected between January 1970 and October 1982 (Figures 38 through 42) reveal that the Triangle and Red Bird Chemical Companies began operations at some time between January 8, 1970, and December 16, 1978 (Figures 38 and 39). Twenty-five storage and processing tanks were visible within the two sites between December 1978 and November 1980 (Figures 39 and 40). On December 16, 1978, an accumulation of drums were present within the Red Bird Chemical facility. These drums were removed prior to November 28, 1980. Several stained areas were also noted within the site at that time.

An aerial survey of the Triangle and Red Bird Chemical Companies was conducted by EPA's Environmental Monitoring Systems Laboratory, Las Vegas, during August and October 1982 (Figures 41 and 42) in order to document the mid-stage and final aftermath of the Triangle Chemical cleanup effort. Approximately 400 drums were visible within the two sites on August 12, 1982. All drums were removed from the Triangle site prior to October 24, 1982, but drums continued to be visible at the Red Bird facility. Tanks and dumps were still present at both sites as of October 24, 1982. A disposal area which had not previously been seen at the Red Bird site was noted on the October 1982 photograph.

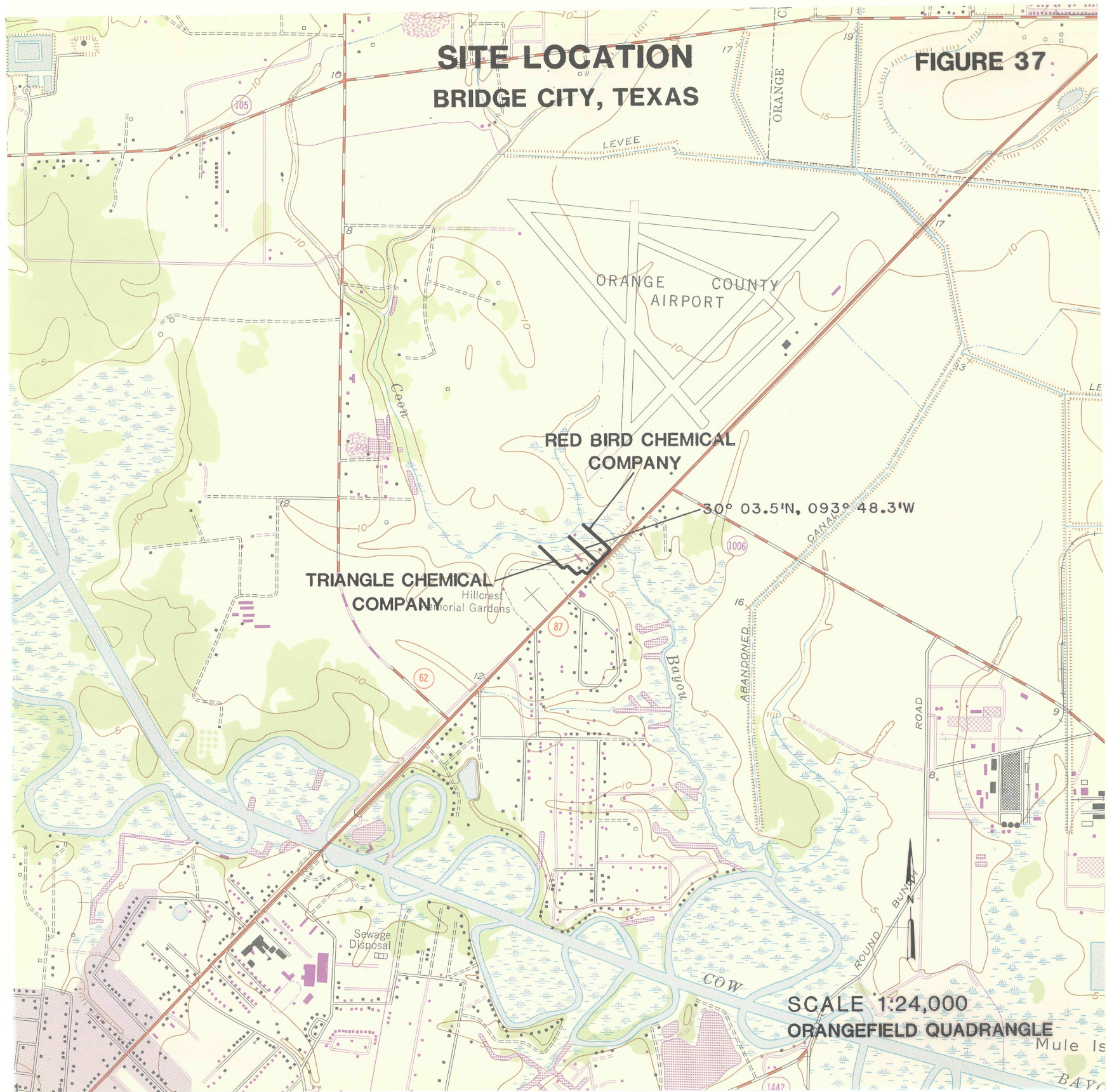


PHOTO ANALYSIS

January 8, 1970, Photograph

Neither the Triangle nor Red Bird Chemical Companies have been established within the study area (Figure 38). A collection of rubble is present upon property that will be occupied by the Red Bird Chemical Company.

**TRIANGLE AND RED BIRD
CHEMICAL COMPANIES
BRIDGE CITY, TEXAS**

FIGURE 38



December 16, 1978, Photograph

Several structures have been constructed upon the Triangle and Red Bird Chemical Companies properties (Figure 39). Eleven vertical tanks which appear to be processing tanks are present at the Triangle Chemical Company facility. There are no containment devices surrounding the tanks.

Fourteen tanks that appear to be used for chemical products storage are present within the Red Bird Chemical Company facility, none of which have secondary containments. A collection of objects that appear to be drums are concentrated within a 260 square meter (2,800 square foot) area. The quality of the original imagery from which this photo enlargement was made prohibits an estimate of the number of drums. It cannot be determined whether the drums are stacked in more than one tier.

TRIANGLE AND RED BIRD CHEMICAL COMPANIES
BRIDGE CITY, TEXAS

FIGURE 39

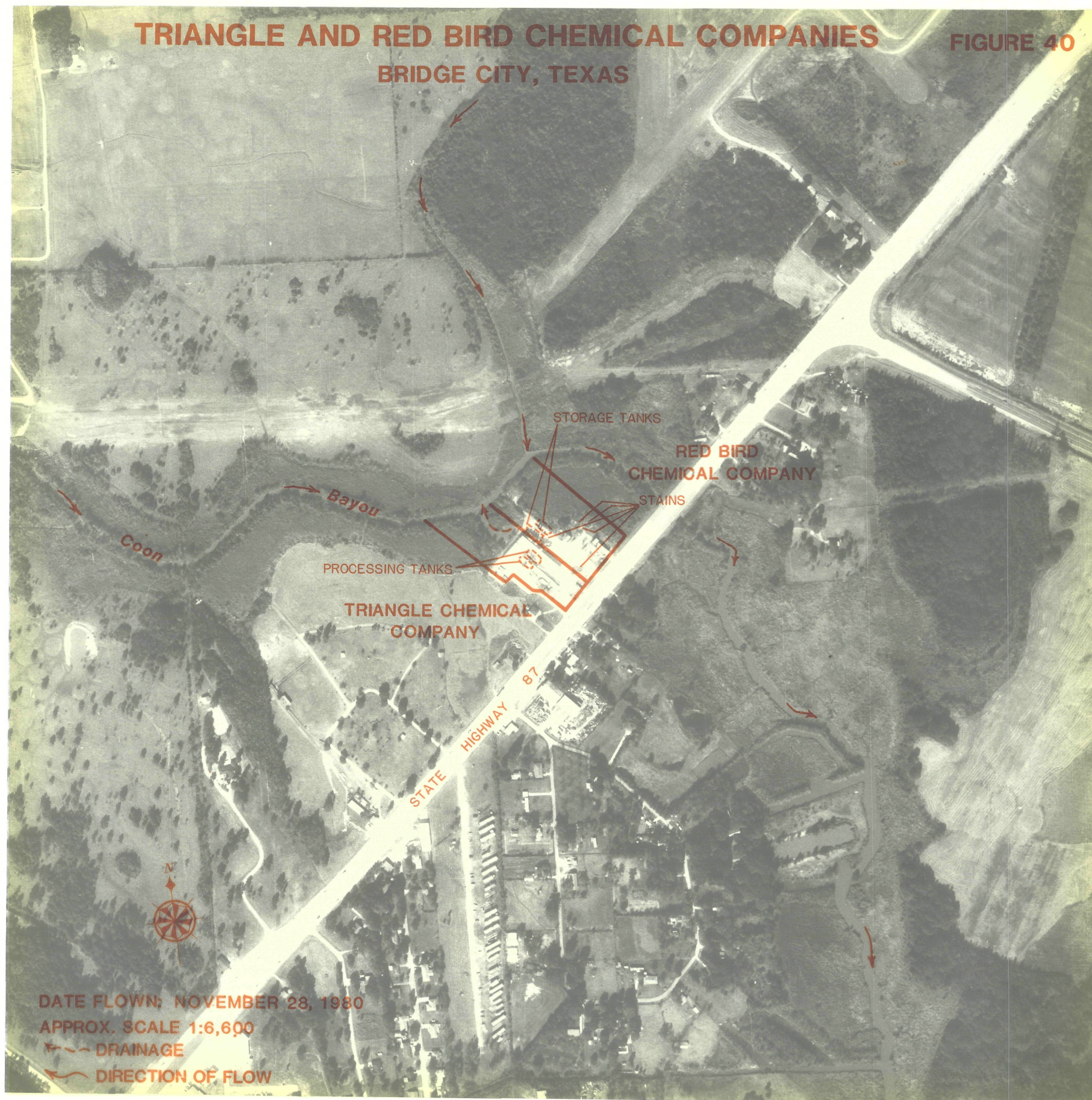


November 28, 1980, Photograph

The Triangle Chemical and Red Bird Chemical Companies (Figure 40) appear structurally similar to their appearance on the December 1978 photograph. The concentration of drums that was present on December 16, 1978 (Figure 39), has been removed from the Red Bird facility. A large stain is visible in the general area where the drums were formerly situated. Additional stains are noted elsewhere within the Red Bird facility. There is no indication that spillage has flowed off the site.

TRIANGLE AND RED BIRD CHEMICAL COMPANIES
BRIDGE CITY, TEXAS

FIGURE 40



August 12, 1982, Photograph

Approximately 400 drums have been deposited within the Triangle and Red Bird Chemical facilities subsequent to November 1980 (Figure 41). A white residue is visible near a concentration of drums that are located in the southeast corner of the Triangle Chemical Facility. A small amount of the same substance is noted upon State Highway 87. Two piles of rubble have been dumped in the northern portion of the site.

Spillage is visible within the Red Bird facility and appears to have drained northwestward into a site depression. Spill stains and dead vegetation are also noted. Some filling has taken place within the site. Brown areas noted within vegetation that abuts both the Red Bird and Triangle Chemical Companies appear to be waterlogged.



October 24, 1982, Photograph

All drums that were present within the Triangle Chemical facility during August 1982 have been removed (Figure 42). An accumulation of liquid remains within the area in which the drums were previously stored. Drums continue to be visible within the Red Bird Chemical facility.

Tanks and dumps which were present on the August 1982 photograph remain intact. Those located within the Triangle Chemical facility (A) are contained by site structures. A second set of tanks (B) located within the Red Bird Chemical facility are enclosed by what appears to be a containment dike. Spillage does not appear to be a threat to Coon Bayou. A small dump that was not present on the earlier photograph has been situated between two dumps that were previously noted on the northwestern edge of the Triangle facility.

There has been no apparent cleanup conducted within the Red Bird Chemical facility. Waste liquid and spillage continues to drain into the area noted on the August 1982 photograph. Areas which have been filled are evident within the site. Stains are visible within the fill material.





MARSHALL ROAD DUMP

PHOTO ANALYSIS

October 24, 1982, Photograph

This dump (Figure 44) is located within a rural area approximately 5 kilometers (3 miles) east of Crosby, Texas. Approximately 350 drums have been discarded within the site (Figure 45). These appear to be the same drums that were present on May 10, 1982 (Figure 7, TS-AMD-82028b, June 1982). A large stain visible amid the concentration of drums may be the result of product that has spilled out of the drums.

Considerable vegetative stress is apparent within a fenced area that is located east of the drum concentration. Several drums are visible within the enclosure. Accumulations of liquid were present within the area on May 10, 1982, but the area is dry on this photo. Solid waste dumps are visible here as well as elsewhere within the site.

A large burn area is noted northwest of the Marshall Road Dump. No evidence of burning was apparent on the May 10, 1982, photograph.



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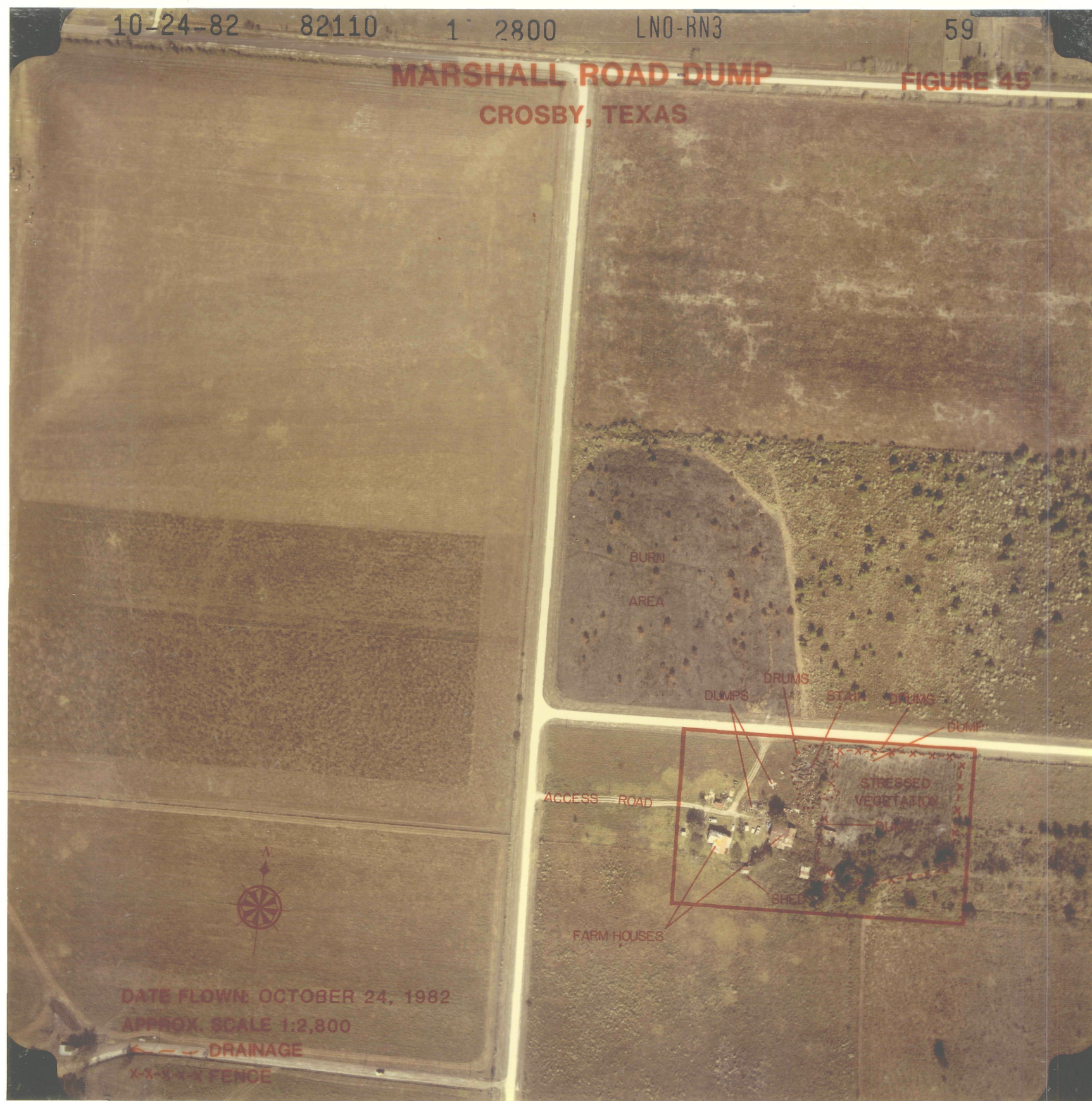
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MARSHALL ROAD DUMP
CROSBY, TEXAS

FIGURE 45



SIKES DISPOSAL PITS

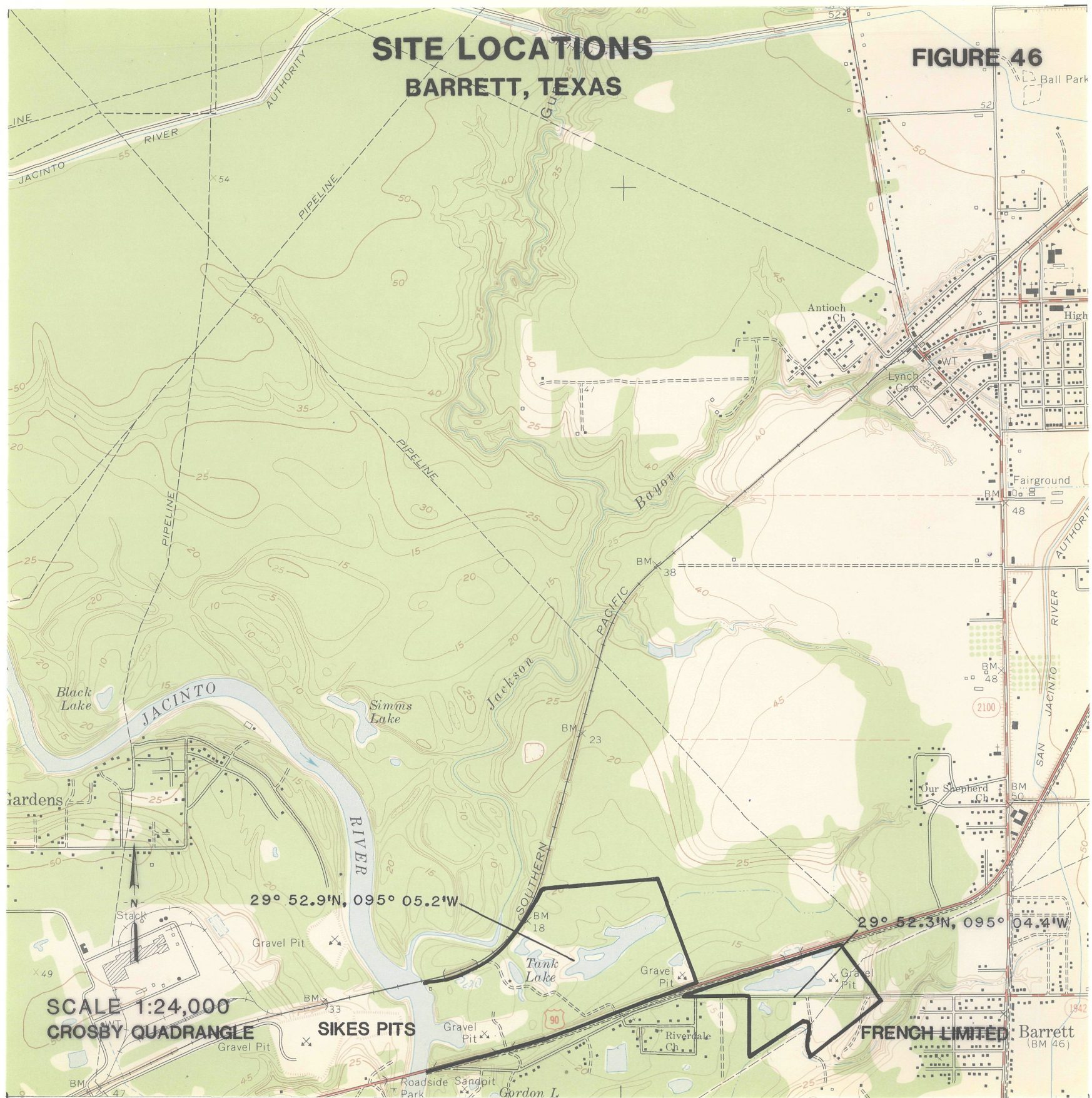
PHOTO ANALYSIS

October 24, 1982, Photograph

This site is a 25-acre waste disposal area (Figure 46) that is located approximately 2 kilometers (1 mile) west-northwest of Barrett, Texas. The site has reportedly been used for the disposal of chemical wastes from nearby petrochemical complexes.

An estimated 100-250 drums are visible at seven locations within the site (Figure 47). An exact count of the drums is made difficult by the manner in which the drums are strewn together. Many of the drums within the largest concentration northwest of Tank Lake are obscured by either soil or underbrush. A highly stained area noted in this vicinity may have originated from drum spillage.

Several small pits are visible within spoil areas that abut the sand-dredged excavations. All were empty at the time that this photograph was collected. Two ponds which were present in the northern section of the site on April 14, 1980 (TS-AMD-8092, September 1980), have been filled. Filling has also occurred within a small area that is located near the San Jacinto River. Two old waste disposal ponds are visible in the same vicinity. Discoloration is noted within a drainage area which abuts the easternmost waste pond. The discoloration may be the result of runoff from the waste pond.





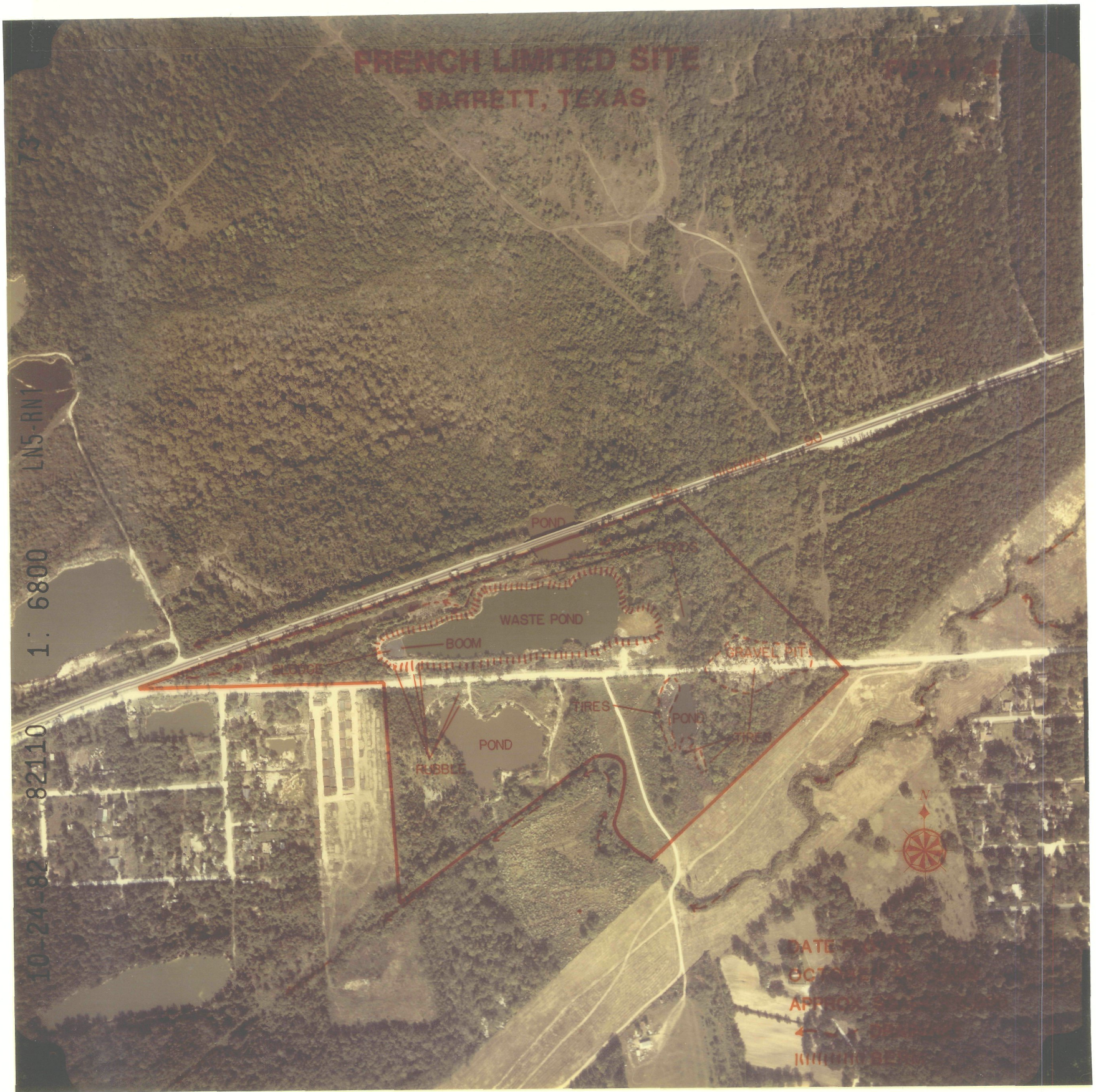
FRENCH LIMITED SITE

PHOTO ANALYSIS

October 24, 1982, Photograph

This site is a waste disposal area (Figure 46) that is located approximately 900 meters (3,000 feet) west-northwest of Barrett, Texas. Liquid wastes are most likely disposed of within a large waste pond which is surrounded by an earthen containment berm (Figure 48). The berm appears to be intact, and no seepages are noted. Sludge deposits are visible at the western end of the waste pond and are separated from the main liquid waste disposal area by a containment boom.

Solid wastes consist of rubble and old tires which have been dumped along the southern wall of the waste pond and within an old gravel pit. Debris and tires are also noted adjacent to, and within, several ponds which are present at the site. A rise in the water level within the ponds would most likely transport solid wastes into the accumulations of surface water.



GENEVA INDUSTRIES

PHOTO ANALYSIS

December 5, 1982, Photograph

This facility is a manufacturer of polychlorinated biphenyls (PCBs) that is located within an oil field (Figure 49) inside the Houston, Texas, corporate limits. Site drainage is westward towards an oil field area that abuts the facility, and eastward towards an unnamed ditch which parallels the facility on the east (Figure 50). The unnamed ditch flows northward towards Berry Bayou.

Few changes have occurred within the facility subsequent to May 10, 1982 (Figure 16, TS-AMD-82028b, June 1982). Accumulations of liquid noted near a waste lagoon and a small waste pond may be seepage or leachate from the waste disposal receptacles. An area located near the northern boundary of the site appears to be stained and saturated from several uncontained tanks that are present in that area. Although only two tanks within the facility appear contained, no spillage is visible within site drainages at this time. Concentrations of drums are present in approximately the same locations in which they were seen on the May 10, 1982, photograph.

Solid waste dumps are again visible in the southern half of the site. Additional dumps are present in the northwest corner of the facility in an area in which they were not previously noted. An area in which the vegetation has been severely damaged is visible in the southeast corner of the site.

